NEW ORLEANS MEDICAL AND SURGICAL JOURNAL

EDITOR: CHAS. CHASSAIGNAC, M. D.

COLLABORATORS:

P. T. TALBOT, M. D., Secretary Louisiana State Medical Society.....Ex-Officio
H. D. BRUNS, M. D., Tulane University of Louisiana.
S. T. DARLING, M. D., Sao Paulo, Brazil.
W. H. DEADERICK, M. D., Hot Springs, Ark.
T. J. DIMITRY, M. D., Loyola University, New Orleans, La.
E. M. DUPAQUIER, M. D. (Paris), New Orleans, La.
A. G. FRIEDRICHS, New Orleans, La.
J. T. HALSEY, M. D., Tulane University of Louisiana.
JOS. HOLT, M. D., New Orleans, La.
E. S. LEWIS, M. D., Tulane University of Louisiana.
R. MATAS, M. D., Tulane University of Louisiana.
AUGUSTUS McSHANE, M. D., New Orleans, La.
PAUL MICHINARD, M. D., Tulane University of Louisiana.
C. J MILLER, M. D., Tulane University of Louisiana.
F. W. PARHAM, M. D., Tulane University of Louisiana.
W. H. SEEMANN, M. D., Tulane University of Louisiana.
EDMOND SOUCHON, M. D., Tulane University of Louisiana.
J. A. STORCK, M. D., Tulane University of Louisiana.

Vol. 74. JANUARY, 1922. No. 7.

EDITORIAL.

THE GORGAS MEMORIAL.

All members of the medical profession will be interested in the announcement of the plans of the Board of Directors of the Gorgas Memorial for the establishment of an institute in the City of Panama for research in the means of prevention of tropical diseases.

Anyone who has seen the old Panama could not but be struck today with its splendid sanitation, its beautiful cities, its five hospitals, and above all, by the completion of the Canal itself, making the present Panama one of the most beautiful and salubrious spots in the world.

It is well known that the accomplishment of this sanitary regeneration of Panama is due to the efforts of the late William C. Gorgas, Surgeon General of the United States Army.

Coupled with his earlier work in Cuba, the accomplishment of General Gorgas in conquering Yellow Fever and Malaria and conclusively demonstrating the fact that health, even in the tropics, is a purchasable commodity has sent forth his fame

throughout the world. His great attachment for Panama has made the proposed Memorial to carry on the work he so ably started, the most practical tribute which could be conceived to his memory.

The conception of this idea is that of Dr. Belisario Porras, the President of the Republic of Panama, who in the name of his government has tendered the site, a building, and all required equipment, valued in all at approximately $500,000. At the request of Dr. Porras, Admiral Braisted, former Surgeon General of the United States Navy, with the co-operation of others equally interested, incorporated the Gorgas Memorial Institute for the purpose, in addition to directing the scientific work, of raising an endowment fund of five million dollars for maintenance.

Dr. Richard P. Strong of Harvard University, was chosen to head the Scientific Board. The Advisory Board, of which Secretary of State Hughes is Honorary Chairman, consists of the diplomatic representatives of all the Central and South American countries and representative committees of national medical and surgical associations, public health groups, and many Southern Societies by which Gorgas was beloved.

The Memorial will be built adjacent to the new Santo Tomas Hospital and the use of its complete facilities has been tendered to aid in the launching of the work. The building will consist of a classic structure patterned after the lines of the Pan American Union in Washington, D. C. It will house the laboratories and provide facilities for the teaching of students from the various tropical countries and from our own leading schools of tropical medicine.

The Tropics, so prolific in vegetation of every kind, have been fertile in the development of all types and kinds of dread diseases, which tended to make them unsuited for habitation before sanitation made them safe. They can become desirable and attractive, as well as prosperous abiding places, a fact which makes Panama most desirable as a home for the Memorial. Its success means the fulfillment of General Gorgas' great desire, to eliminate the devastating tropical diseases, and a fitting recognition of the role of world-wide importance that the medical profession played in the construction of the big canal.

ANTITOXIN BY MOUTH.

It will be remembered that we published, in our November number, an account of the alleged successful administration of diphtheria antitoxin by the buccal route. We expressed the opinion that this was important if true and should be thoroughly investigated as the advantages were obvious if the method proved reliable.

At a recent meeting of the *Société Médicale des Hopitaux de Paris* a report was made by three members who had studied the question and whose conclusions were quite different from the ones previously quoted. They claimed that it could be demonstrated that the antitoxin, when swallowed, did not penetrate the gastro-intestinal mucous membrane, but their chief reliance in their opposition to the newly vaunted method of administration was placed upon the effects of the Schick reaction. It was found that while, in subjects determined to be susceptible to the disease by means of the Schick test, the subcutaneous exhibition of a small quantity of antidiphtheritic serum prevented the positive reaction upon a repetition of the test, the internal administration of the antitoxin had no effect on the Schick reaction.

The above is advanced as proof that the administration of diphtheria antitoxin by the digestive route is without therapeutic effect, hence that the adoption of this method might have the gravest consequences.

We feel it is highly important that we should present this side of the question promptly and with as much prominence as we had previously given to the other view.

ORIGINAL ARTICLES.

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

FACTORS INFLUENCING THE RATE OF MORTALITY IN SURGERY OF THE THYROID GLAND*

By J. M. BATCHELOR, M. D., New Orleans.

In order to discuss those factors that influence and determine the rate of mortality in thyroid surgery, it is first necessary to understand the functions of the thyroid gland, secondly to possess a clear knowledge of tissue changes brought about by thyroid pathology. The function of this gland is well known. It depends upon an internal secretion elaborated within itself. In 1914 Kendall isolated and identified a definite chemical compound to which he gave the name thyroxin, and it is upon this chemical substance that the gland depends for its functional activity. The thyroid gland is the great regulator of cell metabolism. It is true that in the absence of the thyroid gland the ordinary internal cell inspiration is carried on, but this is done in an imperfect way and without the regulation of the specific thyroid secretion, the cellular activity deviates from the normal and there is an arrest, short of complete, cell functioning. It is therefore safe to say that the thyroid gland is the regulator of the internal cell inspiration, and that hyperactivity of this gland produces an intense cellular activity, resulting in a general internal conflagration, with an excessive liberation of energy and a rapid breaking down of tissues. Conversely, deficient thyroid secretion results in subnormal cellular activity.

For the purpose of this paper, only those diseases of the thyroid resulting in hypersecretion will be considered. Reference to simple goitre will be made only to say that surgery in this connection is not attended with more than usual risks incident to major surgical operations.

*Read before the Louisiana State Medical Society meeting, April 19 to 21, 1921.

Adeno-thyroid, with hyperthyroidism and exophthalmic goitre, represent the two types of thyroid disease which produce organic changes, which if prolonged threaten the life of the patient. The cells of the brain, the liver and the myocardium are exquisitely sensitized, and are abnormally susceptible to stimuli, that is to say to physic influences, traumatic, anesthetic and biochemical. Briefly the three dominating factors influencing the mortality rate in thyroid surgery are 1st, the physical condition of the patient when brought to operation, 2nd. the anesthetic adapted to the individual subject, 3rd. the technical skill, experience and judgment of the operator.

The condition of the patient at the time of operation is determined by the measures employed during the preparatory stage of treatment. At this time the mortality rate may be said to be fixed, for the outcome of the case must depend upon the wisdom and care displayed by the surgeon in the adoption of methods for rebuilding the exhausted organism, and erecting barriers against the stress of a serious surgical operation. Thyroid cases that come to the surgeon for operation are no longer merely cases of thyroid gland disease. There is a general cell sickness, and it is during this preparatory stage that all measures should be instituted to restore the patient to as near a physiological equilibrium as possible.

In exophthalmic groitre there are periods of exacerbation and of remission; vomiting, and rejection of fluids is characteristic, so that the tissues become in a measure dehydrated, and alkalinity of the blood is often lessened to a point of acidosis. The metabolic rate is high. Often acetone and diacetic acid are present in the urine. These facts emphasize the necessity for a careful study of each individual case, and point out the importance of treatment to counteract the conditions here outlined. The basal metabolic rate determines the gravity of the disease. Plummer has shown in a large series of cases studied in the Mayo clinic, the invariable correspondence between the clinical symptoms and the basal metabolic rate. If repeatedly determined during this stage of preparation, the rise or fall of the rate will indicate the particular cycle of the disease of the patient under treatment. The patient approaching the crisis of a period of exacerbation is not as good a risk as one with a higher metabolic rate, but who has been shown by re-

peated metabolic tests to be on the ebbing wave and not in the ascending scale of a period of exacerbation.

Presence of acetone and diacetic acid in the urine calls for special consideration, and suggests the possibility of an impending acidosis. There can be no doubt that deaths following operation, credited to shock, are due frequently to an acute acidosis precipitated by the anesthetic, and the trauma of the operation Quillian affirms "that acidosis has a dominating influence in surgery; 2nd, by preliminary and post-operative treatment acidosis may be eliminated; 3rd, post-operative discomfort and nausea are greatly diminished by liberal preliminary use of sodium bicarbonate; 4th, surgical shock may be avoided by preventing acidosis, and by rapid, careful technique in operative procedures. Levison states, "when acetone is present before operation, the organism may be able to take care of the anesthesia without disastrous results, but when diacetic acid is present before operation the condition is aggravated and frequently results in an acid intoxication." These statements emphasize the far-reaching influence of the preparatory stage of treatment. No regimem can be too elaborate, and the surgeon who neglects the most trivial detail in the survey and treatment of the patient prior to operation does not appreciate the responsibility resting upon him, and is building up for himself an unenviable operative mortality.

The question of anesthesia has come to assume a prominent place in operations on the thyroid gland. In the early stages of hyperthyroidism, where degenerations have not progressed to a marked degree, where the myocardium does not show evidence of degeneration, and where the circulation is adequate, the question of the anesthetic is not of extreme importance, but in those cases that are approaching the terminal stage with evidence of decompensated heart, extreme brain sensitization, and all the other symptomatic evidences of the ravages of super thyroidism, the question of type of anesthetic to be employed becomes a matter of foremost importance. All inhalation anesthetics cause suboxidation, with lessened blood alkalinity, and the life of the cell—therefore of the patient—may be jeopardized by the selection of an improper anesthetic. Crile has definitely ruled out ether, and has adopted the combined nitrous-oxide analgesia with local anesthesia. Gas and oxygen in com-

mon with ether does lessen the alkaline reserve of the blood, but it has the advantage of producing no cellular changes in the brain cortex, and therefore does not further lessen or lower the threshhold of brain resistance to afferent stimuli from wound traumatism. The employment of local anesthesia further blocks the afferent impulses originating in the wound, and thus protects the patient from surgical shock. The individual experience and technical skill of the operator are the final factor in determining the mortality of operation. It is often unwise to carry an operation to conclusion, and surgical experience will often dictate the necessity for ending an operation, to be completed at a subsequent time, either the same or the following day, often the few minutes required to complete an operation are decisive in determining the fate of the patient.

DISCUSSION.

Dr. H. P. Jones, New Orleans: It is believed that one of the most important preparations for thyroidectomy is radiation with the x-ray or radium. The effect of one properly applied treatment of the x-ray of the required strength is practically equal to that of ligation, and if you continue to radiate your cases sufficiently, short of destroying tissue, you can in the course of time bring about a condition of hypothyroidism, so that the whole thing is opened up as to whether the treatment of many cases of goiter by the use of the x-ray is not a method of choice as against a surgical procedure. Statistics seem to show from properly selected cases the terminal results at the end of three years from the use of the x-ray are as favorable, if not more so, than those secured from surgical interference. Of course, I know as well as you do that there are lots of cases that we must operate on and as quickly as possible, but it is believed that all cases are benefitted by the use of the x-ray prior to operation. Dr. Cohn and I saw together a case that was disastrously affected by the x-ray, in that perhaps the x-ray was used too much and there was a secondary sloughing of the esophagus, a very serious complication. The patient nearly lost her life, but ultimately made a perfect recovery. The radiation was used first without apparent effect and subsequent operation was undertaken.

There are cases of hypothyroidism produced by the x-ray. It is a matter of interest to me to know that there are reported no cases of tetany following the use of the x-ray, and we ought to be fearful of destroying the thyroid gland to the point of hypothyroidism where we know it may produce tetany.

Dr. F. W. Parham, New Orleans: Dr. Batchelor has mentioned the factors of safety in an adequate manner, and I agree with him.

I want to discuss the particular point Dr. Jones has referred to as I have seen a case with him. It was a remarkable case. There were 9 x-ray treatments given to that young lady. She was in an extreme condition of hyperthyroidism, and where we thought we would give her the benefit of the x-ray treatment. The nine treatments were carried out thoroughly, but there was very little

benefit and she came to operation. The operation was not particularly difficult. I would call attention to too much X-ray radiation before operation which makes the dissection much more difficult. That must be regarded, in connection with later operation. There was leakage in the esophagus so that fluid taken by the mouth came out into the wound. The small muscles of the neck sloughed away. I did a gastrostomy under local anesthesia in order for her to get proper nutrition. The wound finally closed up, and she has today a perfect result from treatment as I look at it. Her basal metabolism is normal. She has made a complete recovery as Dr. Jones has stated.

Dr. J. A. Danna, New Orleans: I rise to express a little skepticism as to the value of the x-ray in the preoperative treatment of goiter. While we do get occasionally a series of reports of very good results, such reports are followed by reports of other men, just as after telling how good the x-ray was for goiter, Dr. Jones said that in one case 9 treatments were given without any appreciable benefit. The men who are doing the largest amount of goiter work, I believe, look upon the x-ray and radium as adjuncts which help in some cases, but which in others do absolutely no good.

It is a question of judgment what to do for a goiter case, when to operate, how far to go, what operative procedure to do. These are points involving as much serious thought and judgment as anything that the surgeon has to decide. A general rule that is followed in handling very sick goiter cases is to get the patient as well as you possibly can with rest and other means. When you get the patient down to the minimum of basal metabolism, as made out by your metabolic tests, or if you have no basal metabolic machine and the means of making these examinations, judgment of the patient's condition is evidenced by the pulse and improvement in the general symptons, then you can do the slightest surgical procedure you can think of, either hot water injections or ligation of one of the poles. If the patient stands hot water injection well, or if the patient stands pole ligation well, you are in a position to know whether to go ahead in a few days or a few weeks and do a thorough and complete thyroidectomy or not. There is nothing a surgeon has to handle which requires more sober judgment than the handling of sick thyroid cases.

Dr. A. C. King, New Orleans: There is just one point in regard to Dr. Batchelor's paper to which I wish to refer in connection with the factors influencing the mortality, and that is the mechanical handling of thyroid cases. The older operators know all about this. This warning I throw out to the young men who are beginning thyroid surgery. One of the greatest factors in influencing results is hemorrhage, and in large thyroids with dilated veins, hemorrhage is simply terrific. I recall a case I had at the Charity Hospital. It was my first case, and Dr. Danna will recall it. The patient survived, but only after an infusion of saline. In these large goiter cases the veins running across are extremely large and in cutting these vessels it is best always to catch them above and below and cut between the forceps.

It is not easy to catch a vein that is bleeding profusely. The field becomes flooded with blood and the vessel retracts, and you have all sorts of trouble, and hemorrhage is a serious handicap in operating on large thyroids. Dr. Miles, one of the former house surgeons of the Charity Hospital, threw out a valuable hint in regard to catching vessels; namely, always see the vessel before you catch it. This holds good particularly in neck work, where the

vessels are so large and so liable to fill the field with blood. That is one of the little things for the young men to keep in mind. The operator must know what he is going to do, and the next thing is to have a capable assistant. When the work is to be done rapidly, the assistant should be as capable as the man who is handling the knife.

Dr. E. Denegre Martin, New Orleans: Not until we begin to use common sense and thresh this matter out well and prepare our cases carefully before operation, will we cease to have this trouble.

The only question is to determine what cases will have to come to operation and what not, and when we have determined this we have overthrown the real difficulty. If a case is treated with x-ray which will eventually have to come to operation, you are complicating the case beyond all expectations. I am afraid to operate on such cases.

Dr. J. M. Batchelor, New Orleans, (Closing): I am very much pleased with the amount of discussion the paper brought out. It was written for the purpose of insisting upon a careful study of each individual patient during the preparatory stage. We must recognize that it is a disease of such variation that the same procedures are not applicable to every case; that we must know the stage of the disease in the individual patient, and take every means of combatting the gravest factor present.

A study of the metabolic rate has done a great deal toward informing us as to the gravity of the disease in each individual case. By repeated estimations of the metabolic rate we are enabled to follow the progress and trace it down, during our period of treatment and medication to a higher state of activity to one approaching normal, if not within a safe limit.

The question of the x-ray versus surgery is one that we could discuss for some minutes. The chief objection to radiation is that we are unable at this time to properly measure the dosage; that we overradiate and destroy the gland, producing hypothyroidism, or we may even, if not producing such extreme changes, cause adhesions which will greatly complicate the operation, producing surgical shock that could have been obviated if the gland was in its normal pathological condition.

Referring to Dr. Jones' question as to why the ray does not destroy the parathyroid, I would suggest that one reason is there are frequently accessory thyroids placed up and beyond the gland and outside of the field of radiation. A second reason would be inasmuch as these glands lie on the posterior surface of the thyroid, which in diseased conditions is very much thickened, the ray does not penetrate with sufficient intensity to destroy the parathyroids.

THE DIAGNOSIS AND TREATMENT OF PERFORATING GASTRIC ULCER, WITH REPORT OF TWO CASES*

By JOHN L. WILSON, M. D., F. A. C. S., Alexandria.

My object in presenting this subject is to call the attention of the general practitioner to the symptoms and early diagnosis

*Read before the Louisiana State Medical Society meeting, April 19 to 21, 1921.

of the condition and to emphasize the importance of an early operation.

"The perforation of a gastric or duodenal ulcer is one of the most serious and overwhelming catastrophes that can befall a human being. The onset of the symptoms is sudden, the course rapid, and unless surgical measures are adopted early, the disease hastens to a fatal ending in almost every instance."—Moynihan.

In making a diagnosis of an acute perforating gastric ulcer it is important that we have a good history of the patient. The patient is usually one who has suffered for a number of years, fifteen or twenty, with gastric disturbance, as a result of chronic gastric ulcer.

These ulcers occur in patients of from thirty to sixty years of age, and are more frequent in males than in females, in the proportion of three to one. Pain or gastric discomfort is one of the most prominent of the symptoms complex. The pain is described as boring, burning, gnawing, cutting, more rarely lancinating, or cramplike, sometimes a dull ache, paroxysmal in character, and at times excruciating, radiating to the back.

The taking of food into the stomach gives relief for a greater or less time, depending upon the kind of food taken. Liquids give relief for a shorter time than a more bulky meal. This is due to the fact that liquids empty from the stomach more quickly than a bulky meal.

The work of Carlson and Cannon tends to show that the cause of pain in gastric ulcer is due to intra-gastric tension and gastric contraction, hunger pain, rather than to the corrosive action of the gastric juices. Tenderness usually exists in the epigastrium or dorsal region, just below the xiphoid cartilage or perhaps a little to the left of the midline. Point tenderness may be found in the back between the tenth and twelfth dorsal vertebræ. It is of diagnostic value, especially when it corresponds to the seat of pain after eating.

We must bring to our aid in diagnosis the roentgen ray. The radiogram properly made and interpreted is of great value in making the diagnosis of gastric ulcer. Stomach analyses are also of value. We should bring to our aid all laboratory methods in the diagnosis of gastric ulcer. With the proper study of

chronic ulcers and diagnosis of them we could in many cases recognize the preperforative symptoms and by a timely operation save the lives of many of these sufferers.

Acute perforation occurs in three percent. of chronic gastric ulcers located on the anterior stomach wall and in nine percent. of ulcers located on the posterior wall.

Perforation of gastric ulcer is divided into acute, sub acute and chronic. The acute perforation occurs suddenly and completely without any protection to the peritoneal cavity, allowing the stomach contents to pour into the peritoneal cavity. In the sub-acute type the opening is smaller, the stomach usually contains less food, the opening usually plugged with omental flap or lymph formation has taken place, thus protecting the peritoneum from contamination with stomach contents, therefore the danger is less to the patient.

In the chronic type the ulcer has eaten its way through the stomach coats, protective peritonitis having taken place, protecting the peritoneal cavity somewhat. This type usually occurs on the posterior wall of the stomach and results in perigastric abscess or sub-diaphragmatic abscess.

Acute perforation is manifested by sudden severe pain in the epigastrium, extreme rigidity of the abdominal muscles especially in the epigastric region. In fact the entire muscular system is rigid. Shock, pallor, subnormal temperature, with pulse practically normal in the first few hours. The practically normal pulse is frequently misleading when thinking of such catastrophe. The gravity of the condition has been overlooked by the best surgeons on account of practically normal pulse.

Leucocytosis is present, vomiting may or may not be present. and may be exhausting; the vomiting will depend upon the amount of food present in the stomach. We cannot appreciate the symptoms in such patients until we have once seen one suffering with symptoms of acute perforation.

When we consider the patient with history of chronic gastric ulcer of long standing, with the development of the above symptoms we may be practically certain of the diagnosis of perforating gastric ulcer.

Treatment. Operation in acute perforating gastric ulcer should be as speedily performed as possible. The mortality in

such cases when operated within four or six hours is very low, after six to twelve hours the mortality will run 50 to 60 per cent and after twenty-four hours practically all die. It is therefore very important that an early diagnosis be made in order that we may give the patient a greater chance for his life.

The incision should be made above the umbilicus, to the right or the left as the surgeon may decide and immediate search made for the perforation, which is usually not difficult to find. We usually see gas or stomach contents escaping from the perforation. That portion of the stomach is pulled up and the rest surrounded by lap sponges rung out of normal saline solution. The ulcer is then closed. Several methods may be used. In the two cases which I give histories of, I closed the perforation with a purse-string suture reinforced with Lembert sutures. We should then search for other perforations, close them if present, cleanse the peritoneum and close the abdomen without drainage in the acute perforations. The matter of drainage will depend, however, upon the conditions found, the time which has elapsed since perforation took place, the amount of soiling of the peritoneum which has taken place, etc. The subdiaphragmatic region, kidney pouches and other regions soiled should be carefully cleansed in all cases.

In some cases where closure of the perforation properly will constrict the pylorus it would probably be well to perform posterior gastric-enterostomy. The excision of the ulcer must be left to the judgment of the individual surgeon.

These patients after recovery from the anesthetic should be propped up on bedrest or pillows. In case the stomach contains food the tube should be used and the stomach emptied. Nothing should be allowed by mouth for twenty-four hours, after twenty-four hours small amount of water, tea, and later small amount of milk allowed. Normal saline glucose should be given by rectum.

Case No. 1. John B. R., Age, 38, American. Father and Mother both living and in good health. Had typhoid fever at age 23, severe. Has had measles, mumphs and usual diseases of childhood. He had an acute attack of appendicitis in 1917, and was operated by Dr. E. D. Martin at Hotel Dieu, this city. This patient had suffered with dyspepsia for fifteen years. He describes the gastric discomfort which he had as a fullness of the stomach, with a dull ache. The discomfort was always relieved for two hours after taking food, after which the discomfort would be as great or greater than before. Finally he got to where he could only take milk. He informs me

that Sodium Bicarb would relieve him temporarily and that nothing else would give relief.

On March 10, 1918 while at work, his occupation being locomotive engineer, he was seized with excruciating, burning pain in the epigastrium. In his words "there is no pain so severe."

I reached him a short while afterwards, found him suffering excruciating pain with extreme rigidity of the abdominal muscles, shock, with practically normal pulse rate. I at once moved him to the hospital and operated within two hours. When the abdomen was opened I at once found a perforated ulcer on the anterior wall of the stomach about 3 inches from the pylorus. The perforation was closed with a purse-string suture, re-inforced with Lembert sutures, the peritoneum cleansed and closed without drainage. He made an uninterrupted recovery, leaving the hospital in about two weeks. He was well or without symptoms for one month after which he began to have gastric disturbance. I then sent him to the Mo. P. Ry. hospital at St. Louis, where they opened the abdomen and found some constriction of the pylorus, with induration and they performed a posterior gastroenterostomy. He has been symptomatically well since that time, able to eat most any food, has gained weight, etc.

Case No. 2. C. R. Age 32, American, Family history same as case number one as they were brothers. He had typhoid fever in 1906. Had measles and the usual diseases of childhood and pneumonia. He had suffered with dyspepsia for fifteen years or more with symptoms about the same as case number one.

On March 12, 1916, just after he had quit work for noon, one of his friends who was working with him, punched at him with his fist and when he suddenly jumped out of the way the perforation took place. I arrived within a short time and found him suffering with excruciating pain in the epigastrium, rigidity of the abdominal muscles as well as the general muscular system, shock, with pulse rate practically normal. I had him moved at once to the hospital, opened the abdomen within two hours, found a perforated ulcer on the anterior wall of the stomach. The ulcer was closed with purse-string suture, re-inforced with Lembert, peritoneum cleansed, abdomen closed without drainage. He made a good recovery and has had no further symptoms. I was assisted in the treatment of this patient by the late Dr. Warren F. Scott.

DISCUSSION.

Dr. E. Denegre Martin, New Orleans: This is a most interesting subject. One of the strongest points Dr. Wilson brought out was with reference to the diagnosis of perforating gastric ulcer. If you have ever seen such a case you cannot very well forget it. There is no rigidity so severe and board-like as in a perforating ulcer of the stomach. Unfortunately these cases get to us usually after perforation has occurred, without any previous history, except as given by Dr. Wilson.

I recall the case of a carpenter, who went to work early in the morning and perforation occurred two hourse later. He stated that he had a little indigestion, but never knew he had any stomach trouble.

I have had four other cases in the last year, and in two of these perforation occurred near the pylorus, so that I was able to resect the ulcer entirely and to do a Heinecke-Mikulicz pyloroplasty. In the first case in which I did this the patient was not in good condition, and nothing more was done at the time than was really necessary as I thought he would die if the operation were pro-

longed. It was done as a life-saving measure; a second operation was necessary in about two months ago. Contraction had taken place, and I had an x-ray picture taken showing the constriction. I did a posterior gastroenterostomy, and recently the patient told me that he was well.

In the second case I was able to resect and do a Heinecke-Milkulicz operation. This resulted in recovery and cure.

In the third the perforation was near the pylorus, and I resected without any trouble. In the fourth case the perforation occurred near the cardiac end and I thought that was a cancer. I was unable to tell at the time because the condition of the man did not warrant prolonged operation. I did not try to resect a portion of the tissue. He died on the eighth day after operation from pneumonia. I was able to confirm the diagnosis.

Dr. Rudolph Matas, New Orleans: There is no better proof of the progress of surgery in Louisiana than the paper presented by Dr. Wilson. Twenty-five years ago, in 1895, when I had the honor to preside over the deliberations of this Society, such a paper would have created a sensation even though it had emanated from the most experienced surgeon in the best equipped hospital of the metropolis. Up to 1895 the literature of perforating duodenal ulcer consisted chiefly of postmortem records. I reported my first experience with this lesion in 1897. I remember in 1900, Dr. Robert Weir, of New York, in his presidential address at the meeting of the American Surgical Association, reported one personal observation and tabulated the first 51 operated cases in the literature, and in only 13 of these, was the diagnosis right and the ulcer found and properly treated. Then, an operation for a perforating ulcer of the duodenum was an extraordinary event, more so if it was followed by a successful issue. Such cases were almost the exclusive monopoly of the largest and best equipped metropolitan clinics. Today, operations for duodenal ulcers have become so common that it would be idle and practically impossible to tabulate them. With improved methods of diagnosis and the increasing safety of surgical explorations the operative treatment of duodenal ulcer has long passed the mark of the extraordinary in surgery. This does not minimize the merit of the performance which demands judgment and skill of high order to be successful, nor does it diminish the splendor of this achievement which is one of the most legitimate triumphs of contemporary abdominal surgery.

The experiences reported by Dr. Wilson demonstrate conclusively that the opportunities for the display of the best surgery are no longer confined, as they were largely,—less than two decades ago,—to the great metropolitan centers, but that the right men equipped in the most modern surroundings, are now available in the smaller cities and country districts. The distinction between the country and the city surgeons has lost its individious significance. The surgeons who reside in the parishes are now making an enviable record for the most skillful and efficient service to their communities.

I congratulate Dr. Wilson for the gratifying evidence of the progress of surgery in Louisiana, and of its diffusion throughout the state, which his contribution has so well exemplified.

Dr. J. L. Wilson, Alexandria (closing): I have nothing further to add except to emphasize the recognition of this condition by the doctors in the smaller towns, because as I have said in my paper early diagnosis and treatment means the patient's chance for recovery is much better. If you wait twelve or twenty-four hours,

the patient is seriously ill, and then if you rush him to a hospital and operate you will have waited too late. The important thing is to carefully observe your cases of chronic dyspepsia which are most likely chronic gastric ulcers. Watch them and, when perforation occurs, do not wait, insist upon immediate operation. Let the patient have a chance to live.

SOME CAUSES AND SOME RESULTS OF CHRONIC INTESTINAL TOXEMIA*

By ALLAN EUSTIS, B. S., Ph. B., M. D., New Orleans.

Not many years ago it was with a certain amount of temerity that one discussed intestinal toxemia, which was earlier mentioned under the broad term, "auto-intoxication," but today, this condition is recognized as a definite clinical entity, notwithstanding the skepticism and cynicism of certain of our leading medical authorities.

Bouchard (1), Combe (2), Metchnikoff (3), Arbuthnot Lane (4), and some few other zealous workers were persistent in their early claims as to the toxic effect of the putrefactive substances, absorbed from the intestinal canal, but so little was then known as to the nature of these toxic substances; while evidences of absorption of putrefactive substances from the intestinal canal with no symptoms demonstrable were so numerous that it was but natural that men with scientific training should be slow to accept new theories and hypotheses.

Without quoting the multitudinous articles in the literature on the subject, which are available in any modern text-book on physiological chemistry, I believe I am justified in stating, First, That the majority of these toxic substances are basic amins formed by the putrefaction of the several amino acids with loss of carbon dioxide. Second, That these putrefactive basic amins have definite physiological action. Third, That they are normally detoxicated by the liver. Fourth, That when they are not detoxicated, they exert their specific, physiological action on the individual.

However, a diagnosis of chronic intestinal toxemia, only, is rarely justifiable, any more than one of achylia gastrica, or tachycardia, unless the cause of same has been ascertained; but on the other hand, severe nephritis, a supposed diabetes, or a

*Read before the Louisiana State Medical Society meeting, April 19 to 21, 1921.

case of supposed hyperthyroidism, not to mention the large number of so-called neurasthenics, may have their causative factor in a chronic intestinal toxemia. With the hope of stimulating more exact diagnosis among those who accept chronic intestinal toxemia as a clinical entity, as well as to demonstrate by case reports, that it is capable of causing severe symptoms and producing pathological changes, this paper has been written.

In previous articles, I have considered the relation of chronic intestinal toxemia to asthma, urticaria, nephritis, and certain cases of arterial hypertension, as well as the importance of a consideration of it in some cases of glycosuria, as well as in typhoid fever and malfunction of the liver. I believe the purpose of this paper can best be accomplished by simple case reports, with a discussion of each case.

Case 1. (Fig 1). Intractable intestinal toxemia with stasis in cecum, due to stenosis of ascending colon from cicatrical contraction after evacuation of rectro-cecal appendicular abscess.

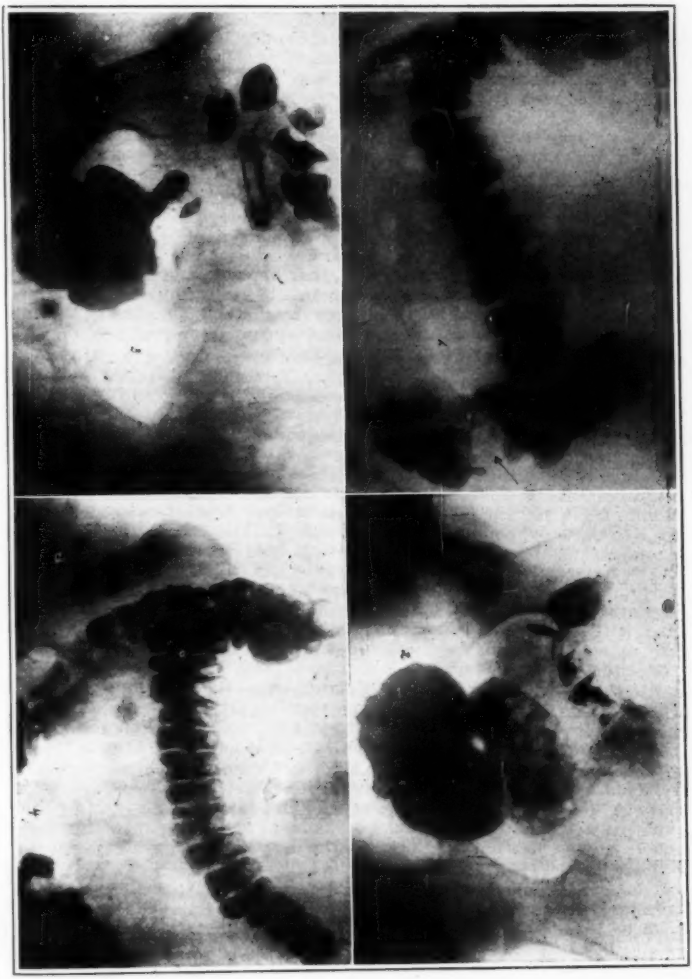
J. M. G., 41 years old, applied to my clinic at the Charity hospital in 1916 for typical symptoms of intestinal toxemia, with a heavy indicanuria. Physical examination was negative. A supposed liver abscess had been drained four months previously and a three inch scar was visible in the tenth intercostal space. A persister indicanuria in spite of active treatment led to a radiographic examination of the gastro-intestinal canal, by Dr. Granger. A stenosis of the ascending colon was clearly visible in the twenty-four hour picture, but its cause was not determined until three weeks later, when he reported that there had been a recurrence of the abscess which had ruptured spontaneously, and evacuated a cup of pus. After injecting the sinus with collargol it was demonstrated by X-ray examination that the sinus led to the head of the cecum. The supposed liver abscess was a rectro-cecal appendicular abscess, which had pointed upward behind the liver. Subsequent laparotomy with eradication of the stenosis by a longitudinal incision through the colon with transverse suture, relieved the condition. The patient's symptoms promptly disappeared and he was able to partake of a fairly high protein diet without any of his former symptoms. The persistent intestinal toxemia led to a suspicion of stenosis somewhere in the bowel, and the x-ray made the diagnosis possible.

Case II. (Fig. II). Intractable intestinal toxemia. Stagnant appendix. Symptoms relieved by appendectomy.

Mrs. J. P. C., 38 years old, consulted me in September 1920, for severe headaches, occipital neuralgia, vertigo, nausea, belching and gastric distension. Physical examination and X-ray by Dr. Samuel revealed a stagnant and chronic appendix as the probable cause of her symptoms of intestinal toxemia and the persistent indicanuria. She was referred to Dr. C. Jeff Miller for laparotomy. At the operation the appendix was found clubbed at the end and contained fecal stones. A Jackson's membrane was also found. An appendectomy was performed with complete relief from all symptoms to date. Discussion. In a very interesting paper by Dr. Love, (6) recently read before the Orleans Parish Medical Society,

3. (Case IV.) Shows entire meal held in terminal ileum after 6 hours.
4. (Case IV.) Same as figure three, after 24 hours, showing marked colonic stasis.

ARTICLE OF DR. EUSTIS.



1. (Case I.) Shows stenosis of ascending colon from cicatricial contraction, result of retrocecal appendicular abscess.
2. (Case II.) Shows appendix visualized after 24 hours with cecal and terminal ileal stasis.
3. (Case IV.) Shows entire meal held in terminal ileum after 6 hours, stasis.
4. (Case IV.) Same as figure three, after 24 hours, showing marked colonic stasis.

ARTICLE OF DR. EUSTIS.

the patulous appendix was considered as a factor in many cases of persistent intestinal toxemia, and he suggested several ways in which this could take place. I prefer the term stagnant appendix, as an appendix may be patulous and still empty on time. The most rational one is that a stagnant appendix acts as a culture tube for putrefactive bacteria, constantly inoculating the cecum with this type of organism. This type of appendix is not to be confused with the chronic appendix with adhesions to the terminal ileum, which will be referred to in another case report. I have more than once been ridiculed by the operating surgeon for advocating removal of these stagnant appendices, for often at operation they appear normal; but invariably the symptoms referable to the associated intestinal toxemia are relieved after operation. That is, patients, who prior to operation could not eat any animal protein without presenting toxic symptoms, are able to indulge in animal protein once a day, without any ill effects after appendectomy, and are relieved of their previous symptoms of intestinal toxemia by removal of the appendix.

The next case also illustrates the importance of considering the appendix as a possible factor in the intestinal toxemia.

Case III. Bronchial asthma with intractable intestinal toxemia and stagnant appendix. Relieved by appendectomy.

Mr. P. O. LeB., 27 years old, was seen by me in April 1920, being a typical case of asthma from chronic intestinal toxemia, which resisted all my efforts to overcome same by dietetic and eliminative measures. He had been having three to four attacks a week. His nose, throat and sinuses were examined by Dr. Lynch and reported as being free from infection, and x-ray examination of the teeth was negative, while physical and laboratory examinations were also negative except for excessive indicanuria. Radiographic examinations of his gastrio intestinal canal by Dr. Samuel, was suggestive of a chronic appendix with cecal stasis. On repeated subsequent examinations an occasional tenderness and relative rigidity was elicited over McBurney's point, and I finally persuaded Dr. Lafferty of Bogalusa, with the consent of the patient, to perform an exploratory laparotomy on the tentative diagnosis of chronic appendicitis. He was operated upon the middle of June 1920, and the appendix which was bound down by adhesions and clubbed at the end, was removed.

He had asthma for two days following the operation, but no further attacks until August 21, 1920, while he had been on a moderately low protein diet, of chicken, milk and cream cheese once a day. On this date he ate fish and drank considerable liquor, with the result that he had asthma for two nights which was promptly relieved by a purgative and a low protein diet for a few days. The patient has since been indulging in a moderately low protein diet and has had no further attacks of asthma, according to a statement made to me at this meeting, by Dr. Lafferty.

Case IV. (Fig. III & IV.) Supposed Neurasthenia with Hyperchloridia; chronic cholecystitis with peri-cholecystic adhesions and terminal ileal stasis from band of adhesions partially occluding lumen of terminal ileum.

Mrs. T. J. F., Age 32, had been treated for neurasthenia, nervous indigestion, and hyperchloridia by various physicians. She was a very high strung, nervous individual when first seen March 11, 1921, but nothing was elicitied on physical examination except slight tenderness over the gall bladder. A severe, persistent indicanuria was present. Radiographic examination of the gastro-intestinal tract

by Drs. Samuel & Bowie, suggested a chronic gall bladder and numerous adhesions binding down the terminal ileum in the pelvis and partially occluding the lumen, with marked ileal stasis. The patient was operated upon by Dr. Allen on March 24, 1921, and a chronic ulcerated cholecystitis was found, and a band of fascia pulling the terminal ileum down in the pelvis. The gall bladder was removed and the fascia delivered. She made an uneventful recovery, and while it is too soon to state the ultimate results, so far, there has been no return of her old symptoms. Certainly there would have been very little chance of accomplishing much unless the cause had been removed.

Case V. Severe Nephritis with uremia. Intractable intestinal toxemia. Patulous appendix and diverticulitis of sigmoid. Relieved by appendectomy and removal of diverticulum.

Mr. F. W. B. Age 58, was referred to me by Dr. Sabatier in Nov. 1917, for albuminuria, constipation, severe head-aches, which latter were so constant, that for the past year they had seriously handicapped him in his work as a notary public. The only points of interest in his family history were asthma in his mother, who had died at 56, and arterio-sclerosis in a sister, who is living at the age of 63. As to his previous history, he denied venereal infection, but had been a heavy drinker, averaging a quart of whiskey a day until 1898, since when he had been a teetotaler. Small-pox and measles during childhood, were his only acute diseases, but he stated that he had suffered from constipation since childhood, often as a youth, passing an entire week without a stool. Regarding his present illness, he began to have head-aches in 1880, usually associated with vomiting and relieved by a brisk purgative, but for the past fifteen years he had suffered almost constantly from head-ache, even after thorough purgation. In October, 1917, he had three convulsions, followed by coma, albuminuria and a systolic blood pressure of 210 m. m. He was treated by Dr. Sabatier by purgation, elimination and a gallon of milk a day, and in two weeks' time his blood pressure fell to 140 m.m., and he was able to resume work, but still troubled with a dull head-ache, which at times would incapacitate him. He stated that he had eaten no beef meat in twenty years as he found that the ingestion of even a small piece would be followed by a severe head-ache, but he had eaten chicken and eggs, and had drunk large quantities of milk.

Physical examination showed a small, poorly nourished man with sallow complexion. No palpable atheroma of peripheral arteries. Teeth in wretched condition from pyorrhea. His heart, lungs and nervous system were negative. His systolic blood pressure was 135 and the diastolic 85. The abdominal viscera was negative except a slightly enlarged liver, which was palpable below the costal arch and which was slightly sensitive on palpation. His weight was 113 lbs.

Urine, 1014, acid, negative except for a plus eight indican and hyaline casts. Phenolsulphonephthallein test showed 35 per cent. excreted in the first hour and 15 per cent. in the second hour.

Blood. White blood count, 8,437; red blood count, 4,660,000; Hemoglobin 80 per cent; Neutrophiles, 37 per cent, large mononuclears 3 per cent, small mononuclears 23 per cent, eosinophiles 18 per cent, basophiles 1 per cent, transitional 8 per cent. No plasmodia. Feces. Negative ova, parasites and occult blood.

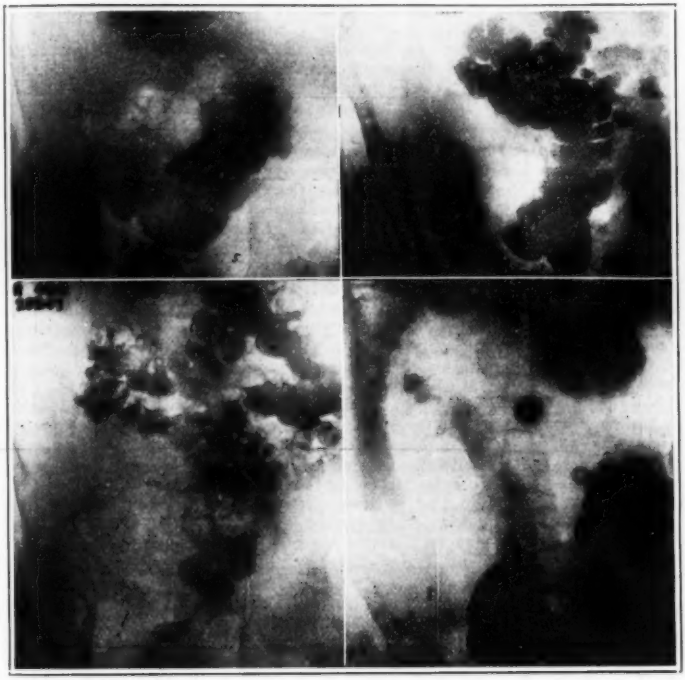
A diagnosis of toxic nephritis was made and an attempt made to overcome the intestinal toxemia, by a low protein diet, elimination and removal of diseased teeth.

The patient returned to me again after a year, with no improvement in his general condition, and even more intense indican reaction, large amounts of albumin and casts, and a systolic blood pressure of 200. X-ray examination at this time by Dr. Samuel, showed evidences of a stagnant appendix and a stenosis of the descending colon with enormous dilatation of the proximal portion of the colon. Operation was advised, and on April 17, 1919, Dr. Allen removed appendix about seven inches long containing three fecal concretions, and a small diverticulum of the sigmoid was found, containing impacted feces. This was invaginated into the bowel and a few Lembert sutures were taken over it. The colon which was very redundant and occupying the entire pelvis was anchored up by suture of the omentum to the anterior abdominal wall. He made an uneventful recovery and when he left the Touro Infirmary his urine was free from albumin and he resumed his work in about a month. He has been free from head-aches, his blood pressure has remained in normal limits and only an occasional trace of albumin is demonstrable.

This case exemplifies a type of nephritis of which I have records of about sixteen cases. There may be a primary cause for the nephritis, such as focal infections, lues, alcoholism, or infectious diseases, but if the kidneys are not too badly damaged, the nephritis can be relieved by treatment of the attendant intestinal toxemia. The importance of determining the cause of the intestinal toxemia in order to properly eradicate it, is well shown in the history of this case. In connection with this case, the recent work of Nellius Foster in New York, is of interest. He has found in the blood of uremic patients a basic substance which is toxic to guinea pigs, while he was unable to find it in the blood of normal patients. The putrefactive amins from the intestinal canal are basic and are obtainable by the method employed by Foster.

Case VI. (Figs. VI, VII & VIII.) Severe constipation and intestinal toxemia from transposition of the cecum, due to adhesions from traumatic peritonitis twenty-five years previous.

Mr. F. O. H., Age 37, consulted me March 28, 1921, for severe constipation since boyhood and symptoms of intestinal toxemia. All examinations were negative except the radiographic, made by Drs. Samuel & Bowie, which clearly explained the cause of his constipation. After six hours the barium meal was found jammed up in the terminal ileum and none had entered the cecum, while the terminal ileum was enormously dilated. The twenty-four hour pictures showed the cecum and ascending colon drawn far over to the left side, with a dilatation of the cecum, which was held in a fixed position by adhesions. After forty-eight hours and after the administration of a saline laxative and the passage of three stools, there was still considerable stasis in the distorted large bowel. Fluoroscopic and radiographic examination of the large bowel following injection of a barium enema showed marked pulling of the cecum to the left side, which was attached, apparently, to the sigmoid. The cecum was noted as being enormously dilated. In seeking for a cause for these numerous abdominal adhesions, it can be found in a history of general peritonitis at thirteen years of age, after having been run over by a wagon, the wheels crossing his abdomen. One hesitates to recommend any surgical interference in such a case, and yet Stockton (8) has recently reported such a case relieved by abdominal section and incision of the bands of adhesions binding the bowel. Without surgery, he undoubtedly will continue to have his present symptoms, although, they may be somewhat relieved by proper dietetic measures.



5. Case VI.) Six hours after ingestion barium sulphate, showing meal held in left iliac region, the cecum apparently held in this position.

6. (Case VI.) After 24 hours, showing cecum and ascending colon held down by adhesions in left iliac region.

7. (Case VI.) After 48 hours, showing enormous accumulation of intestinal gases, with colonic stasis and the bowel held in malposition.

8. (Case X.) After bismuth enema, showing absence of bismuth in sigmoid and a patulous ileocecal valve as evidenced by bismuth in terminal ileum.

Case VII. Intractable intestinal toxemia and asthma. Severe pyorrhoea alveolaris and alveolar abscesses. Relieved by withdrawal of teeth.

Mr. J. M. B., 68 years old, was seen first, Nov. 11, 1920, had suffered from asthma for twelve years, and for the previous seven years it had been almost constant with only a few days at a time when he was free from it. He had severe intestinal toxemia. His nose and throat examined by Dr. Lynch, were pronounced negative. His teeth were in wretched condition, being nearly all decayed, with receding gums and foul breath. Two days after withdrawal of all his teeth, by Dr. Wahl, many of which were abscessed, his urine gave a negative indican reaction, and he was free from asthma. He has remained free since.

Discussion: Attempts had been made to treat his asthma along dietetic lines, but with no success until his teeth were withdrawn. In the successful treatment of chronic intestinal toxemia we aim to transform the putrefactive bacteria to a fermentative type. The constant inoculation of the gastro-intestinal tract with putrefactive bacteria from carious teeth, diseased tonsils, or infected sinuses, neutralize any such attempt, and a careful examination of mouth, nose and throat is always indicated.

Case VIII. Severe intestinal toxemia associated with arthritis of right sacro iliac joint, and sciatica, due to old abscess at site of appendectomy. Associated with this there was also, chronic cholecystitis.

Mrs. J. N. T., 33 years of age, first came under my observation, February 20, 1919, complaining of frequent head-aches with attacks of nauseau and vomiting and excessive amounts of gas in intestines. Pain in the right hip extending down the course of the sciatic nerve was almost constant and necessitated her walking with a cane. She had been married fourteen years, and while anxious for children, three abortions had been performed in the first three months of pregnancy on account of pernicious vomiting. She had had repeated attacks of tonsilitis until tonsillectomy in 1914. In 1916, she fell from a hammock, striking her right hip, and had been lame ever since. Appendectomy for an acute attack of appendicitis was performed in Nov. 1918. She had visited the principal orthopedists in the west and remained in a plaster cast for seven weeks, during Jan. & Feb. 1918. After removal of the plaster cast, her right knee swelled and became painful and she was on crutches for eight months, walking with a cane ever since. Repeated X-rays had shown a sliding sacro iliac joint, but strapping and other usual othopedic measures had failed to give relief. One abscessed tooth was removed in June 1918.

Physical examination. Well nourished and ruddy, weight 162 1-4 Lungs normal, negative d'Espine sign. Heart normal. Systolic blood pressure 138, diastolic 90. Liver, spleen and both kidneys normal. Tenderness on palpation over region of the gall bladder and in the right iliac fossa. No tenderness in left iliac fossa. Patellar reflexes exaggerated. There was restricted motion of right hip and pain on flexion of the thigh and on outward rotation, but no pain or restriction of motion on inward rotation. Motion of left hip normal and painless. Marked tenderness on pressure over the right sacro iliac joint.

Left sacro iliac normal. Lumbar spine normal. Uterus retroverted, adnexia normal. Marked tenderness along the course of the right pudic nerve.

Blood examination: 6.786 whites; 4.540,000 reds; 70 per cent. hemoglobin, color index 0.7; Neutrophiles 41 per cent. small mononuclears 51 per cent, eosinophiles 3 per cent, transitional 5 per cent.

Urine: Slightly acid, 1036, negative except for a plus 8 indican reaction, and a few hyaline casts. Tuberculin tests and Wassermann reactions made in Chicago were negative.

The patient was referred to Dr. Hatch for treatment of the sacro iliac condition, and an attempt made to treat her intestinal toxemia. In spite of the usually successful methods, her indican reaction remained constantly heavy, and this led to X-ray of her gastro intestinal tract by Dr. Samuel, in an effort to find the cause of same. This showed evidences of adhesions in the region of the gall bladder, and the terminal ileum kinked and bound down in the pelvis

with marked terminal ileal stasis after twenty-four hours, and marked cecal stasis after forty-eight hours. After exhausting all conservative methods of treatment she was advised to undergo laparotomy. On March 31, 1919, Dr. C. Jeff Miller operated and removed a thickened gall bladder with numerous adhesions to duodenum and to hepatic flexure of colon. The head of the cecum and terminal ileum was bound down in the pelvis by adhesions, and while breaking them up, a small abscess in the wall of the cecum ruptured, about a drachm of pus escaping in which was found a linen thread which had been used as a purse string suture after appendectomy the previous year. The wound in the cecal wall was closed by Lembert sutures. She made an uneventful recovery, has since been free from any symptoms of intestinal toxemia, and her urine is free from indican on a moderately low protein diet, while she has since given birth to a fine young son, with only moderate nausea during the first four months of pregnancy. All sacro iliac symptoms have disappeared.

Her sacro iliac symptoms were undoubtedly due to the fall from a hammock, but the close proximity of the small cecal abscess which was no doubt constantly draining pus into the cecum, acted as a constant source of inflammation to the sacro iliac joint and was also constantly infecting the cecum with putrefactive bacteria. In addition the adhesions between the colon and the gall bladder delayed proper emptying of this portion of the bowel. It is of interest to note in this case that the vomiting of pregnancy was controlled by overcoming the intestinal toxemia, which has been observed in many other cases. The ultimate diagnosis was reached only after a search was made for the cause of the persistent intestinal toxemia.

This case has been reported in detail as it is so unusual, and so many factors were concerned in the symptomatology that their correlation could not be illustrated otherwise. That a chronic gall bladder is often the cause of a persistent intestinal toxemia, I am fully convinced from the large number in which the symptoms clear up after cholecystectomy.

Case IX. Hyperthyroidism (?) with tachycardia and mucous colitis, associated with severe and intractable chronic intestinal toxemia, caused by a chronic appendix with numerous adhesions occluding the lumen of the terminal ileum; and rupture of the appendix, finally relieved by appendectomy and breaking up of adhesions.

Miss K. E., 58 years old, had been under treatment for five years for hyperthyroidism, when I first saw her in 1915. She had marked exophthalmos, tachycardia, pulse 149 to 169, tremors, frequent attacks of diarrhoea and a severe intestinal toxemia. There was also considerable enlargement of the thyroid gland. Her diarrhoeal attacks were considered eliminative due to intestinal stasis from a chronic appendix with adhesions, but owing to her being such an unfavorable surgical risk, no thought of operation was entertained. An attempt was, therefore, made to treat the intestinal stasis, and intestinal toxemia and for five years a careful control of her diet was kept. She had several attacks of acute appendicitis during this time, but in spite of domestic worries and an active life as a business woman, her exophthalmos gradually subsided, the thyroid diminished in size and her pulse rate subsided to 80 to 100 per minute, but intermittent most of the time. In May 1919, she had a severe attack of appendicitis with rupture and formation of an appendicular abscess, which was drained under local anesthesia by Dr. Allen. After healing of the sinus, her intes-

tines were even more blocked up than formerly from adhesions and contraction of same. In Feb. 1921, under ether anesthesia, Dr. Allen again operated, excising the sinus in which was found a fecalith. The stump of the ruptured appendix was removed after dissecting out all adhesions. This was a formidable undertaking, as the cecum, ascending colon and five or six coils of the ileum were matted together by organized adhesions. She had an uneventful recovery, and today has no sign of exophthalmos, a pulse of 80, which is regular, and there are no tremors, while she has gained fifteen pounds in weight and looks twenty years younger. She is able to live now on a moderately low protein diet, and her bowels have been rarely inclined to constipation since the operation. Time will not permit a discussion as to the relation of intestinal toxemia to hyperthyroidism, and I am not prepared to claim that her intestinal toxemia was the cause of her symptoms of hyperthyroidism, nor on account of failure to perform the Goetsch test and to make a determination of her basal metabolism, am I prepared to say positively that she was a definite case of hyperthyroidism. It is of interest to note, however, that I have records of four other cases with marked cardinal symptoms of hyperthyroidism, where symptoms have been relieved by treatment of the associated intestinal toxemia.

Case X. (Fig. IX). Severe intestinal toxemia, with partial obstruction of the bowel, relieved by passing an enormous tape worm.

Mr. J. G., 41 years old, when he first consulted me in Sept. 1914, had intermittent constipation and diarrhoea, with subjective symptoms of intestinal toxemia and a persistent heavy indicanuria. Fluoroscopic and radiographic examination of the large bowel by Dr. Samuel, after a bismuth enema, showed the absence of bismuth at the splenic flexure, suggestive of a new growth, but palpation of the abdomen was negative. Bismuth meal was arrested in twenty-four hours at the splenic flexure. Examination of the stools and proctoscopic examination was negative, and he was treated expectantly for two years for his intestinal toxemia, enemata at times returning clear to be followed, after taking a purgative by mouth, by copious stools. On March 15, 1916, he passed a few segments of a tape worm, and after keeping on a soluble diet for twenty-four hours, he was given two doses of pelletierine. He passed an enormous taenia saginata, the head of which was identified. I have observed the patient irregularly for the past seven years, and he has no constipation, no intestinal toxemia and no diarrhoea. I am not prepared to state that the tape worm was the cause of the occlusion of the bowel, and it would be of interest to take radiographs of the bowel now, but the patient will not consent, as he states he is well, and has been ever since he passed the tape worm, and he is not interested in the cause of his symptoms, preferring to let "well enough alone." Some may claim that it is purely psychic phenomenon, but it is not impossible for a tape worm to form an intestinal bolus similar to one formed by lumbricoids. Certainly, my experience has been that these latter are often a factor in a severe intestinal toxemia.

I have not attempted to even mention the many other causes of intestinal toxemia, nor have I mentioned the importance of considering focal infections in other parts of the body beyond those mentioned in the few cases reported; but I hope that a review of these cases will result in more careful examination of patients, with resulting greater benefit to the patient.

In closing, I wish to thank Drs. Samuel & Bowie, who have been of inestimable assistance by their radiographic examinations of most of the patients, and to Dr. Carroll Allen for his encouragement and co-operation.

SUMMARY.

1. Certain cases of intractable intestinal toxemia may be due to intestinal stasis from an anatomical abnormality, which can be relieved only by surgical measures.

2. Some cases of chronic intestinal toxemia may present symptoms of hyperthyroidism, which symptoms are relieved by overcoming the intestinal toxemia.

3. Intestinal toxemia may be the cause of an albuminuria and even of symptoms of uremia, relief of which is complete after control of the intestinal toxemia.

4. Severe pyorrhoea may be the cause of an intestinal toxemia, and indirectly the predisposing cause of asthmatic attacks.

DISCUSSION.

Dr. A. E. Fossier, New Orleans: I wish to thank Dr. Eustis for bringing up this very important subject of intestinal toxemia, and especially for reporting one or two cases showing its relationship with the various visceroptoses. He has mentioned Lane kinks and has referred to the pioneer work of Lane. We are familiar with the operation he has devised, and we also know the dangers to which he has subjected these patients in performing this operation for the cure of constipation and the so-called symptoms which accompany it. I wish to say that in my experience, based on 20 years' practice, I have yet to see the case of constipation that demands such treatment as the extirpation of a part of the bowel. I read a paper before this Society two years ago in Shreveport pointing out the injudicious use of such an operation. In the great many cases the symptoms can be ameliorated by the use of a diet which I pointed out and which Mr. Lane accepts. He therefore believes that there may be another cause for the symptoms of toxemia. I do not think it is absolutely due to intoxication. One theory that has been advanced is with reference to the circulatory disturbance we find in enteroptosis. You take the mental symptoms and others and you will find they are very much more easily explained by the circulatory symptoms than they are explained by the intoxication. The organs are down. There is irritation, and there is more or less irritability of every organ in the body. We find it in the stomach, we find again contractions in the intestines, and no matter where there is irritability we have it in the nervous system. Even the vasomotor disturbances show it. These patients have enlargement of the veins over the abdomen. A year and a half ago, when we first began this work, one of the most interesting things we found so frequently were signs simulating arteriosclerosis

Young people we found had contracted arteries until we woke up to the fact it was simply a contraction. The distribution of the blood was not in the surface. The blood was not flowing properly through the brain, and nature, in order to overcome the congestion in the abdominal cavity caused contraction of the arteries in order to furnish a freer flow of blood through the brain. Years ago in working along the same line as Lane we advanced a theory which has little by little been corroborated by many writers. It has gradually come out that the thymus was enlarged in cases of visceroptosis which showed nervous phenomena. In these patients the visceroptosis is the causation. If you take the functional neuroses you will find that many of the symptoms of toxemia have been attributed to the intestinal toxemia. Do not forget to treat your cases of visceroptosis medically, and if you do, you will get results that you cannot get otherwise.

Dr. J. E. Knighton, Shreveport: I think Dr. Eustis brings out very clearly the fact that we should not be satisfied with a superficial diagnosis. Many of these cases of intestinal toxemia have a cause behind them. We should not be satisfied to make a diagnosis of hyperclorhydria or of many other things that are the result, and he has brought out very well the point that the cause behind should be looked for, and many of these cases are just as amenable to medical treatment as a great many of them are surgical cases, and they should be sifted to the bottom to determine those cases which are surgical and those which are medical.

Dr. S. K. Simon, New Orleans: I think Dr. Eustis is to be commended for his long fight on this subject. For at least twenty years he has been fighting the battle of intestinal stasis and the clinical consequences of this condition. His ideas have been based on highly scientific grounds, which is not always true of articles that have been written on this subject.

There are fundamental facts in connection with this subject which I think we ought to recognize. One is, there can be no longer any legitimate question as to the existence of clinical symptoms the result of intestinal toxemia. We have had abundant proof in the last year or two in the relief of this condition by means of certain solutions.

In casting around for a basis to explain the results of clinical evidence of intestinal toxemia in some cases in which the x-ray shows intestinal stasis, and in other cases in which the x-ray shows to have antedated the intestinal stasis, and the reason why some cases show clinical pictures of intestinal toxemia and others do not, I have considered two factors as controlling the situation. One is the effect of the liver which is present in some individuals with intestinal stasis and missing in others. The other factor is whether the stasis is in the right or left colon. By drawing a line in the middle of the transverse colon and observing one can tell whether the stasis is largely to the right of the midline or to the left. In those cases which show a marked stasis in the colon, the intestinal stasis is more marked than in those where the stasis occurs to the left of the transverse colon alone. If you consider the anatomical arrangement of the bowel the reason for that is apparent. The large bowel is largely concerned in absorption, and the lymphatic distribution is much more prominent than in the left colon. When stagnation occurs in the right colon, the amount of toxins is greater than when stasis occurs in the left bowel, and the detoxicating effect of the liver are the two factors which determine ordinarily whether intestinal stasis will produce clinical symptoms or not.

Dr. E. C. Samuel, New Orleans: I have had the pleasure of doing most of this work with Dr. Eustis and Dr. Simon, and I must agree with what has been said earlier in the discussion insofar as the surgery of some of the cases of ptoses that you hear so much about is concerned. We have followed these cases before and after operation quite frequently, and within two or three months we have usually found the bowel down just so far after operation as it was before operation. In a very few instances it is held that the additional adhesions you have gotten from the operative interference hold the bowel firmer down in the pelvis than before.

We do not report stasis in the terminal ileum in this series until after six hours, because normally food leaving the stomach takes from four to six hours for the stomach to empty itself, and at the end of six hours our meal has passed most of the terminal ileum or one-half of it. If it exists longer than that we call it a terminal ileal stasis. Stasis of the ascending colon is only reported if we find it longer than twenty-four hours. If there is a stasis at that time, it is reported to the clinician as a stasis of the cecum and ascending colon. It is very seldom we see stasis in the descending part of the colon. If there is, there is very little attention paid to it from a radiological standpoint. What clinical significance it has I do not know. The marked backing up you see in the descending colon is also seen in the ascending colon. Patients are sent to the operating table and their appendices removed through a small button hole incision. I had a case yesterday at the Touro Infirmary where the appendix was removed through a small buttonhole incision. The patient was eighteen years of age. In three months' time he was suffering just as acutely as before. Radiographs taken yesterday at the end of six hours showed a marked low Lane's kink, with marked adhesions holding the cecum deep down in the pelvis. There should be some attention paid to the kinking of the terminal ileum of Jacksons membrane.

Dr. Carrol W. Allen, New Orleans: This subject is interesting to the surgeon as well as to the internist, and as I have operated a great many cases and have come to some conclusions, I would like to say a few words. The basis of a kink, like any band of adhesions, is a mechanical thing. When it can be relieved by supportive means, medical means, well and good. A patient does not need an operation, but in the great majority of these cases in a Lane kink and ptosis, I do not see how any mechanical support will relieve. You may benefit a patient by improving the peristalsis, by bringing about evacuation of the bowel, unloading the burden on the colon, and favoring a higher position of the colon with better drainage and circulation.

As to the mechanical effect, there is one thing which is often overlooked that has to do with the symptoms, and that is interference with the circulation as a result of the ptosis. If the mesentery of the large bowel ordinarily has a loop six inches long and should lie below the umbilicus, you get an explanation regarding the dropping of it five or six inches more, so that it lies at the brim of the pelvis, and we know where the mesenteric attachment is. That vascular loop is twice as long as it should be. Stretching of the vessels interferes with the curculation. The arteries can better carry the blood supply down to the bowel because it is propelled by the **vis a tergo,** but when we come to the venous return we have stasis and get congestion with imperfect action of the bowel favoring toxic accumulations and their absorption. When we can operate after the internist has failed, in my experience from the records I have kept, I have obtained results

that were very satisfactory, and when these patients ask me what the prospects are, I usually tell them that 75 per cent. of the symptoms can be relieved by operation. We do not get perfect restoration, but about 75 per cent. of their discomforts are relieved.

To go back and refer to the history of the operation, I will say that I have only done the Lane operation of excision of the colon once. Two years ago I skiagraphed that patient and the terminal ileum was very much dilated and taking on colonic function. Consequently, I do not know that that operation is particularly to be recommended, although we do see some cases in which it is desirable. Coffey, of Portland, has done much work on that line and with gratifying results. I have sometimes modified Coley's technic as I think it is applicable to the cases, and I have followed a great many of them, and in two cases have had skiagraphs made, and whereas there was some slight fault following the operation, it by no means represented the condition that was presented before operation. The patients in a good many instances have very much improved in symptoms and physical condition. In one case of which I have notes there was a gain of thirty pounds, other report 15 to 20 pounds, and are better physically and mentally. As to the toxic side of these cases, one patient complained of headache, of a migraine character, but that has cleared up.

Dr. Allan Eustis, New Orleans (closing): Unfortunately time would not permit me to report them so I take this occasion to mention two cases that were operated on by Dr. Allen which were not amenable to medical treatment. I tried to do some good for these patients medically. They ran a persistent indicanuria. One of them had a former uremia, a toxic nephritis. After the removal of the stagnant appendix and a diverticulitis of the sigmoid, there has been a complete relief of the headache, the albuminuria, and high blood pressure.

Another case of rupture of the appendix, with subsequent adhesions, was operated by Dr. Allen. One case formerly gave definite symptoms of hyperthyroidism, i. e., tachycardia, exophthalmos, with a pulse of 140 to 160 with marked tremor. The patient was relieved of symptoms by gastro-intestinal measures. She had a ruptured appendix that subsequently gave adhesive bands resulting in operation. She has shown remarkable improvement since the operation, and today her pulse is 80 with no symptoms of hyperthyroidism.

I thank Dr. Simon for his kind words, as well as Dr. Samuel and Dr. Allen for their constant co-operation and encouragement in this work.

DIABETES AND PREGNANCY.*

By DR. I. I. LEMANN, New Orleans.

The frequency with which glycosuria is encountered in pregnancy makes this an ever timely topic. It is variously estimated that sugar is found in the urine of from 10 per cent. to 45 per cent. of all pregnant women. It is true that in some cases the sugar is lactose and in these there is no question of the ex-

*Read before the Louisiana State Medical Society meeting, April 19 to 21, 1921.

istence of diabetes. This occurs more particularly during the latter days of gestation and in the puerperium. Ney (1) found lactosuria in 77 per cent of parturient women, but in only 16 per cent. of those who were pregnant. It is not my purpose to discuss here the very innocent condition nor shall I discuss methods of identifying the various sugars in the urine. I shall confine myself to the consideration of true glycosurias, namely, those cases where the sugar has been identified as glucose.

Even where the sugar in the urine has been proven to be glucose we are not warranted in assuming that we are dealing with diabetes mellitus. This is particularly true where the glycosuria has made its appearance during the course of pregnancy and has not pre-existed it. Many of these glycosurias will be found to be independent of the carbohydrate content of the diet and the blood sugar percentage is normal and even subnormal. Such cases, therefore, are renal diabetes (innocent). They are extremely common, so common that Frank (2) regards their occurrence as normal. Novak, Porges and Strisower (3) having found two such cases consecutively were led to a similar belief that the occurrence was not a coincidence. They observed shortly thereafter five other pregnant patients with glycosuria, in none of whom was there an increase in the blood sugar and in none was the quantity of glucose in the urine influenced to any degree by variations in the quantity of carbohydrate consumed. In this connection the determination of the behavior of the blood sugar after the ingestion of a large amount of glucose on a fasting stomach and the plotting of a blood sugar curve after the method of Hamman is of great value and importance. Some months ago a lady in the seventh month of her first pregnancy was sent to me because she had shortly prior thereto begun to have small quantities of glucose in her urine. It was not difficult to show that the glycosuria had no relation to the ingestion of carbohydrates and that the blood sugar level was normal while the renal threshold was low. The blood sugar after a glucose meal rose promptly as usual and promptly fell without making a plateau at the top of the curve characteristic of the true diabetic. This patient went through the rest of her pregnancy on a liberal diet with comfort and was duly delivered of a healthy child.

Attention has been repeatedly called to the fact that in rare instances diabetes appears to be induced by pregnancy, being manifest only during the pregnant period and absent in the intervals. (Naunyn (4) Futcher, (5), Foster, (6), Joslin (7). Some, at least, of these cases may prove upon study by modern methods to belong to the group of renal diabetes but others have in the past experience developed into full blown cases of true diabetes mellitus. Thus Foster reports a case in which "there had been a pronounced glycosuria during two pregnancies which had entirely subsided after the birth of each child so that there was no sugar in the urine and no diabetic restriction was employed. During the third pregnancy there was observed not only glycosuria but also a moderate increase in thirst and following the termination of the pregnancy the sugar excretion and symptoms persisted. The woman became a typical diabetic. An attitude of caution is necessary, therefore, with regard even to my patient whose history was outlined above. The status of her carbohydrate metabolism should be investigated again while she is not pregnant and her possible future pregnancies also should be watched with more than usual care.

The general attitude of the profession with regard to the occurrence of diabetes and pregnancy together has been one of great pessimism. Offergeld (15) in 1908 reported a collection of cases in which 30 per cent. of diabetic mothers died in pregnancy or at time of delivery and 24 per cent. more died within thirty months after confinement. Naunyn (4) considered the life of the mothers much endangered and that many died in the first days after delivery of coma or collapse. Williams collected 66 cases in which 27 per cent. of the mothers died in labor or within two weeks thereafter and an additional 23 per cent died within two years. Foster (6) says: "It is now generally believed that the danger of pregnancy in diabetes is comparable to that of patients suffering from tuberculosis and severe valvular disease." On the other hand Van Noorden (8) saw no unfavorable effect of the pregnancy on the diabetes as illustrated in five diabetic women. Eshner in 1907 collected from the literature eight cases of pregnancy in diabetic women. Two of these diabetic women became pregnant three times, one became pregnant twice. No mother died in pregnancy nor in the puerperium. Three died within two years after

confinement. In twenty-seven other cases in which diabetes developed as a complication during pregnancy, seven mothers died in pregnancy or puerperium, eight more within two years. Glycosuria recurred in four pregnancies in one case; in two pregnancies in three cases. It recurred during pregnancy in three other cases after having been previously temporarily present. Joslin, (7), in the second edition of his book, has reported twenty-three cases of diabetes associated with pregnancy, which he has divided into two groups, namely, mild and severe. In the ten mild cases there were fourteen pregnancies and eleven children and both mothers and children were well. Of the thirteen patients with severe diabetes nine were dead. It is not at all clear from Joslin's report in his book and his article in the Boston Medical & Surgical Journal (10) that some at least of his mild cases were really diabetes mellitus and not renal diabetes. Five at least of the ten became aglycosuric after delivery. No statement is made as to the blood sugar.

Joslin doubts the probability of the aggravation of diabetes by pregnancy. He says "It cannot yet be accepted as proven that pregnancy aggravates a diabetes. It is quite possible that the reason for a patient with diabetes becoming worse during pregnancy is simply due to the ingestion of an unusual quantity of food." Allen is inclined upon the basis of experimental work to agree with Joslin that the effect of pregnancy upon diabetes is slight.

It has even been suggested that pregnancy may temporarily improve a diabetic. Cases have been reported where patients exhibit glycosuria in the non-pregnant state but have less glycosuria or no glycosuria as long as they are pregnant. In other words their carbohydrate tolerance is increased by pregnancy. Eshner and Foster have each reported one, Joslin two such cases. I may here report a similar one from my series:

Mrs. S. F., Aged 20, consulted me December 10, 1915, because of glycosuria. The glycosuria had been discovered four and a half months previously by her family physician because she had had a pruritus vulvae. She had formerly weighed 135 pounds but had lost 9 pounds. She had been married only a few months. She was easily made sugar free and her carbohydrate tolerance was determined to be in excess to 75 grams. She became pregnant within a month of her first visit and all

during the pregnancy remained without glycosuria although she ate freely of all kinds of fruit and as much as 2 1-2 ounces of bread daily. August 30, 1916, she was delivered normally without anesthesia of a seven-pound boy. Through a mistake of the nurse she ate even a sweet sherbet during the puerperium without having sugar in the urine. She went through the lactation period equally well but never ate sweets and restricted her bread more sharply than during gestation. Sugar did not reappear until March, 1917. It was again possible easily to rid her of the glycosuria and to maintain her so. During my absence in the army, 1917-1919, she exceeded her tolerance and I found her emaciated and toxic upon my return in March, 1919. She went steadily down hill, the carbohydrate tolerance decreased until it was 10 grams and below. The last months of her life were miserable and the scene was finally closed in coma April, 1920, after she had broken her diet. The child is living and healthy.

These cases of increased carbohydrate tolerance during pregnancy recall the experiments of Carlson and Drennan (11) and Carlson and Ginsberg (12). These investigators have shown that " whereas total extirpation of the pancreas in non-pregnant dogs resulted promptly in the onset of pancreatic diabetes, complete pancreatectomy in pregnant bitches near term is not followed by hyperglycemia and glycosuria as long as the fetuses are alive and placental connections are not severed. At the onset of labor the blood sugar begins to rise and characteristic pancreatic diabetes is established on completion of delivery." They believe that the internal secretion of the fetal pancreas passes through the uterine membrane in sufficient quantity to prevent diabetes in the mother. Allen (13), however, reports that he has not been able to repeat Carlson's experiments because he has found that pancreatic resection to the point of diabetes seems absolutely incompatible with the continuance of gestation. His observations lead him to the view that no appreciable quantity of internal pancreatic secretion passes from fetus to mother and he interprets Carlson's results as due to cachexia.

As to the effect of the diabetes upon the pregnancy there is almost universal testimony that it is most unfavorable. Foster (14) says: "Conception is most frequently followed by early abortion; with a minority, pregnancy terminates with late

abortion; while a small percentage give birth to living children."

Offergeld's (15) figures would indicate that 51 per cent of the fetuses die intrauterine, 10 per cent. die within the first few days and another 13 per cent. die within the first year. Eshner's (9) series show that in the cases of mothers already diabetic before pregnancy, six out of fourteen fetuses died intrauterine or at birth and that in those cases where diabetes occurred as a complication of pregnancy, seventeen out of twenty-seven fetuses died intrauterine or at birth. Hydramnios is exceedingly common.

When confronted with glycosuria in a pregnant woman the practitioner has a heavy responsibility. Has his patient truly diabetes? If so, what should he do to lighten the burden and improve the chances? Should the pregnancy be terminated? Many obstetrical authorities have unhesitatingly recommended such a course as giving the best chance to the mother. There is a marked difference as to the severity of the cases and the gravity of their situation according to whether the glycosuria pre-existed the pregnancy or not, and Joslin makes two classes accordingly. Pregnancy occurring in an already confirmed diabetic is a grave complication whereas the glycosuria making its appearance for the first time during the course of a pregnancy is usually benign. The reason for this benign character may lie in the fact I have already indicated, that this glycosuria is caused by a temporarily lowered renal threshold, not by a disturbance of the carbohydrate metabolism. But even when the patient is undoubtedly diabetic and even when the diabetes pre-existed the pregnancy, there is much to be said to controvert the old time pessimistic prognosis. The newer method of treatment as championed by Allen and Joslin certainly hold out much more hope of help. Even the old authorities were not of the opinion that diabetes was necessarily an indication for the interruption of the pregnancy. Naunyn, the great leader in the study of diabetes, stressed the need of individualization and advised that abortion should be induced only when the mother's condition is such that she seems threatened in some special way by the diabetes. Allen's (16) present statement is that "termination of pregnancy is no longer a justifiable routine measure in diabetic women." The treatment of diabetes in preg-

nant women should follow the same lines as in the non-pregnant state. It will be found that the disease can usually be held in control about as readily as in the cases where there is no pregnancy. Only where this is not the case and where there is aggravation of the disease can we justly consider abortion. It is to be remembered that the dangers of induced labor are likely to be as grave as those of labor at term. The great danger threatening the pregnant diabetic is the same as that threatening the nonpregnant diabetic, namely, acidosis and coma, and it is in combating this, or rather in the prophylaxis of this, that the new dietetic methods serve their greatest purpose. Our attention should be constantly focussed upon this rather than upon the grade of the glycosuria and it is because the protection of carbohydrate metabolism is at the same time a protection against acidosis that we strive to keep the carbohydrate content of the food within the ability of the damaged or weakened pancreas to care for it. It is even more important to restrict the fat content of the food to the point where the oxidation processes of the body can burn it all up and leave none in the form of incompletely oxidized products—the acetone bodies—to poison the patient. Patients properly watched and properly safeguarded in this way may go on and do go on to term. The situation is somewhat comparable to that of the preparation of diabetics for surgical operations. Formerly diabetics were a *noli me tangere* for the surgeon but today it has been shown that the diabetic, when properly prepared by appropriate preliminary dieting, may be operated upon with no greater mortality than the non-diabetic.

The appearance of albumen and casts is most serious and the full development of a severe nephritis may require the interruption of the pregnancy.

At the time of delivery it is important to avoid chloroform and ether anesthesia as likely to precipitate acidosis and coma. Gas-oxygen is the anesthetic of choice. Joslin advocates and has used Cesarean section as minimizing the length and the dangers of delivery.

Summary: I. All glycosurias of pregnancy are not diabetes mellitus. Many are innocent renal diabetes.

II. All patients, however, showing glycosuria during pregnancy should remain under constant observation during preg-

nancy and should be thoroughly investigated after the termination of pregnancy .

III. Abortion is not to be advised as a routine.

IV. The treatment of the pregnant diabetic is the same as that of the non-pregnant.

V. The danger of acidosis is to be avoided by the restriction of fats and by the choice of gas-oxygen as an anesthetic.

REFERENCES

2. **Archiv. f. exp. Path. u. Phar.** 1913, LXXII,387.
   (Quoted by Foster; Diabetes Mellitus. 1915. p. 99).
3. **Deutsch. med. Wchnschr.**, 1912, XXXVIII. 1868.
   (Abstract **Am. Jour. Med. Sci.**, CXLVI. 290)
4. Diabetes Mellitus in Northnagel Series.
5. Asler & McCrae, Modern Medecine. II. 677.
6. Diabetes Mellitus, 1915.
7. Diabetes Mellitus, 2nd. Edition.
8. Der Diabetes Mellitus, 3rd Edition. 1893. Quoted by Eshner.
9. **Am. Journal Med. Sci.**, 1907. CXXXIV. 375.
10. **Boston Medical & Surgical Journal**, Dec. 2, 1913. CLXXIII. 84.
11. **Amer. Jour. Physiol.**, 1911. XXVIII. 391.
12. **Amer. Jour. Physiol.**, 1914. XXXVI. 217.
13. **Amer. Jour. Physiol.**, 1921, LIV. 451.
14. Loc. cit., p. 131.
15. **Arch. f. Gynaek.**, Aug. 15, 1908. Quoted by Foster.
16. Nelson. Loose Leaf Living Medicine.

DISCUSSION.

Dr. J. B. Elliott, New Orleans: I have seen a woman in the last seven days who bore a child two and a half years ago. She developed glycosuria in the last two months of her pregnancy. There was sugar found in her urine the following two years, and last year when the urine was examined it was found negative for sugar. A few days ago I found the blood sugar was away above normal.

Dr. Allan Eustis, New Orleans: I cannot agree with Dr. Lemann. As he was finishing his paper regarding nitrous oxid anesthesia, he may not have given it much thought, but he contradicted certain statements made in the earlier part of his paper. Nitrous oxid is an acid, and by inhaling it you lower the alkali reserve. If you give an anesthetic, ether is preferable to nitrous oxid, but local anesthesia is preferable to either of them, in diabetics.

I recall two diabetic cases in which it was necessary to operate on account of an emergency appendix. The surgeons, both preferred nitrous oxide on account of the fear of gangrene from local anesthesia, and both of these patients went into a prompt coma, with death, which would not have happened if local anesthesia had been used.

Dr. P. B. Salatich, New Orleans: In making routine examinations after delivery we notice so many patients who have one-half or one

per cent. of sugar in the urine for one or two days and then it disappears. I recall one woman who at the time she was about to wean her baby came down with a bad appendix, and examination of her urine showed 3 per cent. sugar. I said to the pathologist, we cannot operate on this patient with 3 per cent. sugar in her urine although she does not look sick. I said she is not nursing, and she has not nursed her baby for two or three days. Her breasts are very full. The pathologist said that is a little too much and he would not advise operating on a patient with 3 per cent sugar. He would let her wait a while. The patient, being a poor woman, I sent her back home, and that when her breasts were dry she was to come back and if I found that her urine was free from sugar I would operate on her. In two weeks she came back with her breasts dry and absolutely free of sugar.

Dr. E. L. King, New Orleans: I think the point brought out by Dr. Salatich of finding sugar in the urine of a woman after delivery is very important. However, it is lactosuria and not true diabetes. The same is true in the latter two months of pregnancy when the breasts are getting ready to perform their function and we find sugar in the urine. We very seldom find an obstetrical case at the Charity Hospital in which pregnancy is complicated by the presence of sugar in the urine. There may have been one occasionally, but since I have been on the service we have not had any. I looked that matter up in Hirst and various other textbooks. Hirst says he does not find Fehling's solution is reduced in more than 1 per cent of his cases, in his routine office examination of pregnant women. He quotes a series of 715 cases of true diabetes in women, and only three of these true diabetics were pregnant women.

The termination of pregnancy comes up occasionally, and as Dr. Lemann mentioned the termination of pregnancy by Cesarean section is advocated not only by internists, but by such men as DeLee and others to relieve the strain, so as not to allow these women to go through a long and tedious labor.

Dr. I. I. Lemann, New Orleans (closing): I wish to emphasize the viewpoint of the great danger of diabetes. We all have a notion that the danger lies in the swamping of the body economy with an excess of sugar, but the danger of diabetes lies in the incomplete combustion of the fats, and we have the curious phenomenon that in the presence of an overabundance of sugar in the tissue in the circulating blood there is incomplete usage of that sugar and incomplete combustion of the fats. Some one has said that the fats are burnt in the fire of the carbohydrates, and where the carbohydrates are not burnt the fats are incompletely burnt. There the danger lies for the pregnant woman, and there the danger lies for all diabetics. So that we are watching the grade of the blood sugar and watching the grade of the glycosuria, not so much because we are afraid of the excess of sugar in the body, but because we know an accumulation of the excess of sugar means incomplete combustion of the fats. Again, the safeguard of the pregnant diabetic woman lies more in the restriction of the fats than in the restriction of the carbohydrates.

I was not aware of the point Dr. Eustis made, and I shall be glad to think it over. Undoubtedly the safest anesthetic is a local anesthetic. I have heretofore been under the impression that gas oxygen was preferable to ether; certainly is far preferable to chloroform which must be absolutely tabooed.

THE MANAGEMENT OF A SMALLPOX OUTBREAK*

By DR. JOHN CALLAN, New Orleans.

When the transfer of the Health Department from the old regime to the new took place on December 8, 1920, a smallpox situation had existed here for some time.

Immediately a crusade of vaccination was started. A faulty system had existed in New Orleans for many years—the parochial and private schools and the higher institutions of learning had not demanded a vaccination certificate as an entrance requirement. Through the powerful assistance of his Grace, the Archishobp of this Diocese, and of Fr. Twellmeyer, his Supt. of schools, and Fr. Carra, his Supt. of Asylums, and Dr. Dinwiddie, President of Tulane University, and the Presidents of Straight University and New Orleans University, these institutions were very quickly attended to. With the aid of the physicians of the Board of Health and the great number of physicians located in these various church parishes, the vaccinations were very promptly done. A follow-up was made to catch the failures and in that way we were enabled to reach a large proportion of the population of school age. Physicians all over the city began vaccinating among their clientele, and as every focus of infection showed the physicians of the Board of Health followed, vaccinating. Intelligent lay inspectors traced the cases back to their places of employment and to their friends. Many concealed cases were found by these men. The vaccination in each focus, as a rule, involved the vaccination of the people of the square in which the focus existed and the eight surrounding squares. Interesting data have been gained by this system, accounting for the development of cases far from their infecting source. All employees in the place from which the case was traced were vaccinated. On December 8, when the new forces took charge, there were 64 cases in the Isolation Hospital and 8 cases domiciled in houses. This number increased until about February 1, when there were 113 cases in the Isolation Hospital and 22 cases in 20 domiciles. Whenever a case could be kept at home, under proper care, we permitted this, otherwise it was removed to the Isolation Hospital. We met with no opposition in individuals, although the anti-vaccination-

*Read before the Louisiana State Medical Society meeting, April 19 to 21, 1921.

ist worked his typewriter and pen overtime in communications to the Health Office and the newspapers. Reporters importuned us to answer these communications and were rather insistent about it. I took the firm stand that I was too busy to enter into such silly discussions, but, however, if any of them wished to discuss the subject with me that I would discuss it with them in the Isolation Hospital at the bedside of those suffering with smallpox. None accepted the ground on which I was ready to enter into a discussion, they preferred a long distance discussion where they thought they were in a bomb-proof place of safety.

The Isolation Hospital is built in two distinct buildings with no intercourse between them; one half has a capacity for 100 beds, occupied by the smallpox patients, the other, 100 beds, occupied by the venereal patients. Because of the gravity of the situation, and of the way in which the venereal problem was handled, I immediately ordered the venereals out of the place but could not get them out until December 22. I would have more air and space for the small pox. On Dec. I entered this place for the first time, saw the congested condition and as a first measure of relief, I ordered that patients should sleep alternately head and foot to obviate cross infections. I had instructed the vaccination of every one entering this place, even though they had come to the place with smallpox, this to be repeated every day for four days. This was done to protect those entering the hospital through errors of diagnosis. Some might figure that observation rooms or wards should be had for such cases. My reasoning led me to a different conclusion, for here in our city four wards were necessary, two for the black, male and female, and two for the white male and female. I reasoned that if I had gotten two patients, one with and one without smallpox, that the non-smallpox case was exposed, and after all the only means that we have to prevent this disease is vaccination. This would also necessitate a separate corps of help and nurses. A tremendous expense that after all gave no protection.

After December 22 all our factors were at work. That of obviating cross infection, that of vaccination and that of more cubic air space for the patients. At that time ten days had elapsed from December 12, we began to observe cases were dry-

ing up quicker, many cases about the middle of the vesicular stage, when the vesicle becomes milky and opaque, there seemed to be a sudden cutting short into the pustular stage, and cases began to dry up quickly. This was given more close observation and was attributed to the influence of the vaccine, the mortality dropping from 24 in the first 100 cases to 5 in the next 100, where it has about remained.

We have tried the intravenous injection of the filtered vaccine in one case, a profoundly toxic one, but without result. On the second day we were encouraged in noticing a marked drying, but the next day the case died. This filtrate was used to vaccinate some children. It proved to be inert. There are many interesting problems which are yet to be setlled. I would say first the intravenous injection of vaccine as a curative agent. Personally, I believe it will do well, and secondly the duration of the period of infectivity, this can be settled by animal experimentation. The management of this outbreak was done without the employment of guards on the houses which, to my mind, is necessarily inefficient because of back door escapes.

Vaccinate, vaccinate the contacts, follow up your vaccinations, chemical disinfection, sun, light and air, these are the great factors. Old theories die hard, and that of fomites certainly shows a vitality that is remarkable. As knowledge of disease after disease grows, fomites get staggering blows. I am not a strong believer in fomites as a means of conveying smallpox. If so the fomites must be very fresh, not long from the patient. When science unfolds the microorganism, I am sure we will find one of extremely low and short-lived vitality from its native habit. Insect transmission or intermediary hosts do not appeal strongly to me.

DISCUSSION.

Dr. J. C. Gremillion, Alexandria: Some years ago I was connected with the Board of Health at Alexandria for ten years. We found at that time that if we could detect a case of smallpox before the pustular stage and vaccinated other members of the family, we never had the disease to occur in that house. If we did not detect a case in the pustular stage the vaccination did not protect. The question arises, were those already infected, or did the vaccine break the infection they had? That is a question I would like Dr. Callan to answer. The patient the doctor had in the hospital, who was immune, is very interesting, and that explains why smallpox is so much less virulent than it was before vaccination took place. If a mother is vaccinated, she confers a certain immunity to her

child, and that is why smallpox is less virulent today than it was years back.

Dr. Joseph G. Stulb, New Orleans: I wish to explain the high mortality in 1920 in order to compare it with the period of my connection with the Board of Health in 1917, 1918, and 1919. My mortality was 5 deaths in three years.

Regarding the birth of the child in the isolation hospital, I will say that I was very fortunate. I had two white men with confluent cases of smallpox with lesions of the heart, edema, showing kidney complication, and furunculosis. I discharged these two women well from the institution. Two had a live baby in the uterus, and one month after leaving the institution the mother bore a healthy live child. In so far as the birth of the child in the isolation hospital is concerned, I would like to ask Dr. Callan how many days had the woman had smallpox before being admitted to the Isolation Hospital? This will bring out some very nice points. My experience with the Board of Health has been that I was always to be called in on the tenth or eleventh day to make the diagnosis. It was very seldom that a physician would report a case to the Board of Health on the appearance of the papular eruption. The eruption would always be pustular, and that would be in and around the ninth day. Two or three days would elapse before umbilication would take place.

Dr. M. H. Foster, Alexandria: The City of Alexandria has one of the best co-ordinate health departments in the state as attested by a specialist on city building. Mr. Allen D. Albert, made an analysis of the health situation and gave out figures from his office stating that Alexandria enjoyed the lowest mortality rate that he knew of. We had the unique mortality rate of 7.8 for white per 1,000, whereas the average urban mortality in this country is 15.

In regard to health work as a protection against smallpox in the community, I have noticed two difficulties. One is from the antivaccinationists, and the other is the customary discussion among the doctors of the communities as to whether we have smallpox or chicken pox. Difficulty encountered with the antivaccinationists, I am glad to say, is diminishing very much in our city due to better vaccine and better methods of application. I think the arm should be aseptically protected after being aseptically vaccinated. The custom among the physicians of the communities is to kill valuable time before taking active precautions by discussing chicken pox and smallpox.

Some years ago, a doctor was called from Alexandria to settle a discussion as to whether an epidemic was chicken pox or smallpox. Physicians were divided on the subject. The doctor's bill was $100.00. Recently, a man doing genito-urinary and dermatological work was called to settle the same kind of discussion. I have had no difficulty in convincing myself that the disease was smallpox, and routine vaccination was done in the community, and the condition promptly disappeared.

Dr. John Callan, New Orleans (closing): I mean by infectivity the extreme period of infectivity. Nearly all authorities agree that in the period of invasion the disease is infective, and that most of these cases will continue until the stage of desquamation is complete. We live on that tradition in dismissing our patients. We want them free from blemishes. We want them clean before we let them out. That is what I meant by the long period of infectivity.

Regarding the woman referred to, I do not know how many days she was sick, but I think it would be wrong for men to be in doubt

about the diagnosis until the suppurative stage is reached. I must expect early reports from physicians if they expect me to do any thing with these transmissible diseases.

Dr. Foster raised an interesting point, namely, there is more or less confusion existing between varioloid and varicella. Any one reading the history of variola will find that doctors have been confusing varicella and varioloid which is a word that is not being used much now in the literature, and I am skeptical of any varicella in the adult. We must prove that it is not smallpox. I think the safety of a community lies in taking that stand.

If one reads up the history of isolation hospitals the world over, it is amazing to see how many things get into an isolation hospital—everything from tuberculosis to appendicitis, and you wonder why. The why of it is because these are peculiar cases, and anything springing up in a house, unless it is a broken leg that is objective, is better and safer under isolation in an institution.

One of the puzzling cases was a young negro about 19 years of age. I think he would have puzzled any faculty. They got a report at the office. I knew two physicians were debating about the diagnosis. One of our men was sent to see him, and I said to him one day why dont they settle it? We cannot have that doubt going along. It was finally decided that he had smallpox. Two or three days later I got a report from the hospital to the effect that it was a case of measles. I go down to the hospital every Sunday evening. I do not want anybody to go away with the idea that I am treating smallpox; I am only managing to give directions about these cases. As soon as I saw the negro I remarked to the superintendent that no wonder they were confused over his disease. He looked in surprise when the black skin swelled up. He got over the active bumps that were on him, and every time a fellow's finger ran over an active bump on that swollen skin he was sure he felt the shock. I think it would have fooled anybody. We vaccinated him, followed our rule, and sent him out all right. He did not get smallpox. That brings us to one point about observation wards. We have no facilities for observation wards. We need four of them.

After all, the only agent or measure that I know will control smallpox is vaccination, and we have followed it out, and only one case came in with an error in diagnosis. She developed a light fever and a few papules, although she had a successful vaccination.

These are interesting stories of cases, and I often think that when they put me in the health office, if they would lock me up in the isolation hospital, I think I would know more about smallpox.

ACUTE OSTEOMYELITIS.*

By ISIDORE COHN, M. D., F. A. C. S., Professor of Clinical Surgery, Tulane University.

A great deal has been written during the last few years on the subject of traumatic bone lesions which have become secondarily infected with a resultant sequestrum formation—such have been erroneously called osteomyelitis. These should be considered more properly under other heading.

---

*Read before the Orleans Parish Medical Society, October 24, 1921.

Very little has been written on the subject of acute hematogenous osteomyelitis during the past several years. Osteomyelitis is a crippling disease when not recognized early. Many have undergone numerous operations because of the failure to recognize the true condition sufficiently early to prevent sequestration. For the above reasons this disease presents many problems which should interest the surgeon, pediatrist, internist, and orthopedist alike.

It may be well at the outset to state certain convictions on which this paper is based. Though many of the ideas are not new they may prove worthy of consideration.

(1) Osteomyelitis is a blood borne disease. (2) It localizes primarily in the medullary canal. (3) There are no early X-ray findings on which a diagnosis can be based. (4) Early diagnosis must be made if we expect to cure the patient without prolonged treatment and multiple operations. (5) The early operative findings may be only a fat necrosis of the medullary contents without frank pus. (6) Early operation should give almost instant relief from pain, a subsidence of temperature, and an early recovery, with perfect restoration of function (7). Early operation should not be followed by sequestrum formation (8). Early diagnosis and operation should remove osteomyelitis from the class of chronically disabling diseases.

That osteomyelitis is a blood borne disease has been accepted by all who have written on this subject since Lexer's work. Trauma plays an important etiologic part in the production of the disease. If it is accepted that it is a blood stream infection the early manifestations should be constitutional in character and in this respect we are not disappointed. Fever, chill, at times malaise and localized pain over the shaft of one of the long bones are the outstanding characteristics. Redness and localized edema often surround the area of tenderness pointed out by the patient. If to the above syndrome we add leucocytosis, which is usually marked with a differential count showing a proportionate polynuclear increase, the diagnosis of osteomyelitis is indicated.

The X-ray is of negative value here. In the early stage when we are dealing only with nature's response to the infection, by the determination of a greater amount of blood to the part, the pain is due to the increased intra-medullary pressure. The

early pathological picture is one of fat necrosis. These changes are not evident radiologically. The X-ray can be of service by showing a difference in density of the structures involved. Before bone destruction has occurred there is no difference in the density, hence we should not expect to find evidence of rarefaction, and as a mattr of fact we do not find such changes. If we wait for such evidence before operating we will most certainly have to deal with a sequestrum. Simmons, after a study of 97 cases agrees that the X-ray is always negative at this stage.

Having determined on the diagnosis it is necessary to operate at once. The operation should be done as quickly and with as little trauma as possible. There are several points to remember: The bone should be approached by the most direct route without doing injury to important structures; where possible approach in the inter muscular planes is preferred. If one finds pus under the periosteum he should not stop, but proceed to open the medullary canal as the infection has reached the cortex through the Haversian system—the infection is primarily within the canal. The approach to the medullary canal is best done by making use of motor-driven instruments, the drill or trephine. Make a sufficient number of drill openings, after which the several openings are connected on either side by a motor-driven saw. In this fashion as much of the cortex can be removed as is desired (Figure 1) By the above technic we avoid the great amount of trauma incident to the use of the gouge, the chisel and the mallet.

The importance of this last statement cannot be stressed sufficiently.

The importance of fat embolism in connection with bone trauma is neither sufficiently understood nor appreciated.

Caldwell and Huber in 1917 discussed the subject in **S. G. O.** in 1917. The work of Busch done in 1866 is reviewed in the above mentioned article.

Busch showed that bone lesions are associated with fat emboli, that injury to the marrow results in fat emboli, and further that these emboli, are carried off by way of the veins. Ribbert (quotation from Caldwell and Huber) found that by striking the bones of the leg of the rabbit a series of blows with a mallet, a pulmonary fat embolus was produced. Warthin

reported eight fatalities from fat embolism following fractures. Bergemann as early as 1910 admitted the possibility of fat embolism resulting from jarring of bones and hence suggested the possibility of dispensing with the use of the chisel in surgery altogether. A greater appreciation of the danger of fat embolism following the use of the chisel and other similar instruments which jar and traumatize bone certainly should impresss us with the necessity of minimizing trauma, and this is accomplished by motor-driven instruments.

By the above method the canal is opened rapidly. One may only find a few fat globules. This and not frank pus is evidence of an early diagnosis. At this point one may by the injudicious use of the curette or other instruments do great damage. The object of the early operation is to relieve tension and to provide free drainage. This is accomplished by simple opening of the canal.

The curette may and probably often does great damage, by injuring the endosteum, the active bone cells lining the pipe stem bones. These are the cells on which we are dependent for regeneration of bone at this level.

This is not the only danger, we may injure the nutrient vessel, which supplies the greater portion of the shaft. Such injury may result in massive sequestration.

It is only necessary to put in a pack of Dichloramine T, or if one prefers he may Dakinize. Personally I prefer the use of Dichloramine T as it is simpler and equally as effective.

The results obtained by the above method of treatment are gratifying—usually there is immediate relief from pain—the temperature drops to normal and the cavity rapidly heals like any other clean wound. There has not been a secondary operation in any of the cases which I have thus treated. The cavity fills up and after a period of one year the defect in the bone is so completely regenerated that radiologically one cannot see where the defect has been. (See Figures II-III).

We have seen the defect in bone made by a trephine completely replaced by new bone from the endosteum in experimental animals. I quote from an original paper published in 1916 on the subject of "Bone Repair" (**S. O. G.,** Cohn and Mann):

"A defect was made in one side of the shaft with a trephine. On one leg the periosteum was sutured over the defect and on

the other leg we removed the periosteum in the neighborhood of the trephine opening. The animals were sacrificed after seven, nineteen and seventy-six days respectively. After seven days the edges of the old bone gave no evidence of a reparative process, except in the region of the medullary surface of the bone. The trephine opening is filled with a delicate connective tissue plug, many of the cells being elongated spindle cells. At some distance from the trephine opening on the shaft underneath the periosteum, and hylane cartilage. The endosteum opposite the trephine opening also shows activity from irritation.

After nineteen days the inner half of the trephine opening has become completely filled up with bony trabeculæ arising from the medulla. The plug of connective tissue above is being invaded by proliferating subperiosteal blood vessels.

The subperiosteal proliferations of bone has almost reached the region of the trephine opening.

The seventy-six day specimen showed the trephine opening closed by bony trabeculæ which have grown up with trephine opening from the endosteum. The difference between the specimen on which the periosteum was left intact is that the "defect is filled up to a much greater extent."

CASE REPORTS.

Case of P. E. C. Examination November 1st, 1919. Diagnosis: Acute Osteomyelitis.

I was called to see patient November 1st. 1919 at 6 P. M. The following history was obtained.

Patient had been in bed since yesterday morning (October 31) with temperature of 103. Mother had noticed some redness over the shaft of the tibia (left leg) marked pain on pressure. When seen by me his temperature was 102.

Examination: Heart and Lungs—negative. Throat—negative. Abdomen—negative. Leg: On the lower third anterior aspect of left leg there is an area of redness about three inches in the long axis of the leg. The leg was tender to the touch in its entirety. A diagnosis of acute osteomyelitis was made and the patient was taken to Touro for an immediate operation. Blood count: 12,000, Poly, 83 per cent.

Operation: Ether anesthesia, Miss Armstrong.

Operator. Isidore Cohn.

An incision was made about four inches long over the anterior inner aspect of the left leg, periosteum was retracted, and with the aid of the motor drill, three drill holes were made in the shaft of the tibia. With the motor and saw a bridge of bone was removed. The only thing found in the medullary canal was fat globules and

blood. Dichloramine T and a rubber drainage tube were introduced down in the medullary canal. Two silk worm gut sutures were introduced into the skin. Simple dressing applied. Patient returned to bed in good condition.

Post Operative Course: Temperature dropped to normal the morning after the operation, and at no time after that did it rise above 99 3-5. The wound was dressed on the fourth day, there was considerable ooze when the pack was removed. A similar gauze drain with Dichloramine T was introduced into the depths of the wound. He left the hospital on November 6, five days after the operation. Dec. 12: The wound has almost healed, and healing has been from the bottom. There is no pain and patient is walking with a stick with no discomfort. August 18, 1920: No pain in leg. No discomfort. There has been no discharge from the wound since patient's discharge in December.

Examination: The scar is broad, painless. Under the scar area it seems that the defect is completely filled by a material of density almost identical with the surrounding areas. There is a slight cortical thickening beyond the area of scar.

X-ray reports following operation: Figure 1. Radiographic examination of the left leg of Mr. C. shows evidence of a defect in the shaft of the tibia at the junction of the middle and lower third with beginning bone deposit in this area. There is no evidence of any bone disease at the present time. Figure 2. Radiographic examination of the leg shows the tibia to be in good condition at this time. Some thickening of bone at the junction of the middle with the lower third. (Eight months after operation).

Case of E. S. Acute febrile reaction—pain in the leg, localized areas of tenderness over the middle third of the shaft of the tibia. Leucocytosis and polynuclear increase. Immediate operation same type as P. E. C. Convalescence in every way the same as the previous case. Figure three illustrates final results.

Patient was exhibited on October 25, 1921, showed small linear scar on the anterior aspect of the leg which is flush with the surface of the skin. No apparent difference in both legs.

X-ray one year after operation. Radiographic examination of the right leg of Mr. S. shows a moderate thickening of the middle third of the shaft of the tibia. There is, however, no evidence of any old diseased process of the tibia further than this.

The above cases illustrate the value of immediate operation, evidenced by relief from pain, the subsidence of temperature rapid uninterrupted recovery of perfect function, as well as complete regeneration of bone.

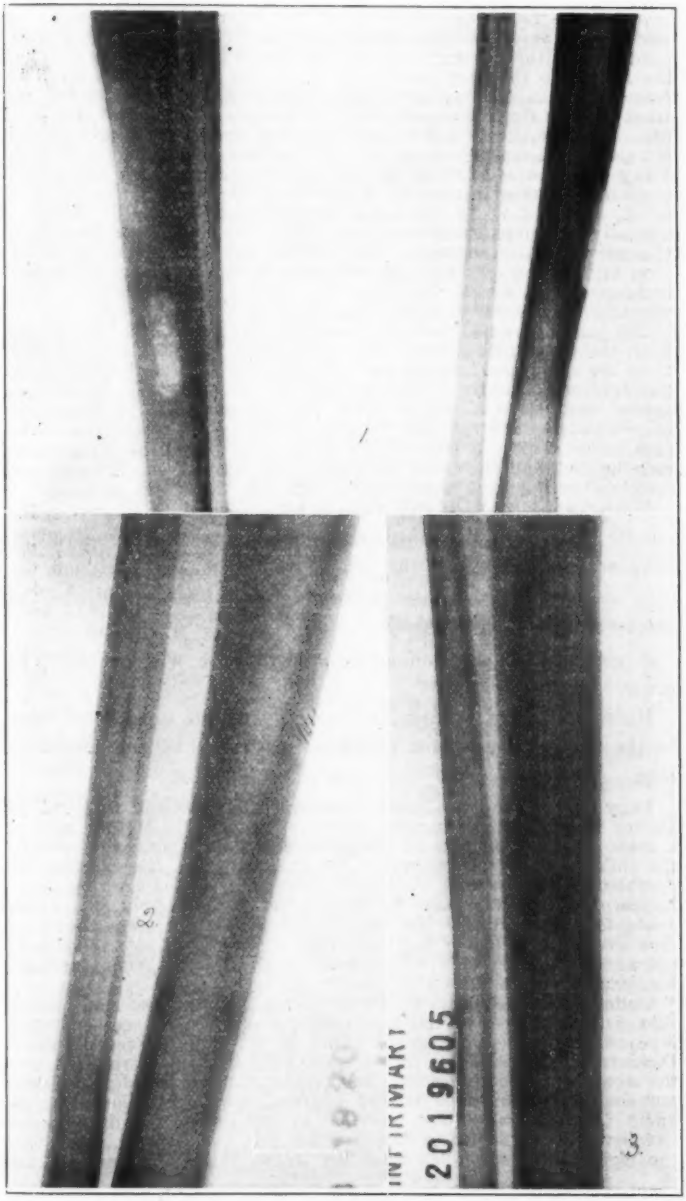
The following case with many others like it, might be of value to show the disadvantage of delayed diagnosis.

History of Case A. L. Examination by Doctor Banber.

Complaint: Slight cough, right leg swollen from under knee down. Pains in small of back. Temperature every night. Diseases: measles. Flu, 1918.

Child awoke one night two weeks ago with pain in the right leg. Thought pain was due to having played baseball.

Examination: Right leg is swollen, very painful calf muscles. Child referred to Doctor Cohn for examination. The examination



1. P. E. C. shows opening made in cortex with motor drill and saw.
2. Result eight months after operation.
3. E. S. One year after operation. Shows complete reconstruction of cortex without evidence of previous bone disease.

DR. COHN'S ARTICLE.

revealed the following: Swelling of the outer side of the right leg particularly over the upper portion of the fibula. There is a mass, hard tender to the touch which extends over the middle third of the leg up to the popliteal space; there was at least one inch difference in the size of both legs. Palpation anywhere along the shaft of the fibula caused pain. A diagnosis of acute osteomyelitis was made, X-ray was requested and an immediate leucocyte and differential requested. Total 16,200; differential, 82 per cent. poly. X-ray revealed rarefaction of the upper fourth of the fibula. Immediate operation was done. Patient was first seen by me at 10:45 A. M. operated 12:30 the same day at Flint Goodrich Hospital, Operative findings in the case as follows: Under ether anesthesia (Doctor Jones), Assistant, Doctor Pitkin, incision beginning at the level of the head of the fibula extending downward about six inches. Incision made directly through the muscle, immediately large quantity of pus was found—at least six or eight ounces.

The periosteum had been perforated by the infection of the fibula. With the hand introduced it was noted that the infection extended up to the epiphyseal line and had completely separated the shaft from the epiphysis. With a motor drill the shaft of the fibula was opened and pus was found. This upper portion of the fibula was so completely infected that it was necessary to resect the upper four inches. This was done with a motor saw. Small bleeding points were ligated, and Dichloramine T pack was introduced. The skin and muscle over the pack was sutured with silk worm gut sutures.

Many other cases of this type could be cited to illustrate the results of delayed diagnosis, as well as incomplete operation. Sequestrum formation, the death of the entire shaft of the bone or death of the patient from sepsis, at times may be the outcome of delayed diagnosis.

A report of cases seen late in the disease will probably be made.

Metastasis often takes place and any of the long bones may be the seat of metastasis. This is illustrated by the following case.

Baby A. Diagnosis: Acute Osteomyelitis. Patient referred by Doctor Butterworth. Sunday, October 5th, 1919. Mother noticed a mass on the right side of the chest a few days ago; she brought the child to Doctor Butterworth for examination. His examination revealed nothing except this mass on the right side of the chest wall. Leucocyte count was made by Doctor Neff 24,000, poly 83. I was asked to see the child. My examination revealed a mass about 1-2 inch in diameter above the right nipple, mass was soft, fluctuant, not adherent to the skin, very tender to the touch. When the mass was papated, it was under the pectoralis major muscle.

Under ether anesthesia by Doctor Caine, incision was made in the skin, and the fibres of the pectoralis major muscle were separated, incision was then made in the axilla so as to allow free drainage. Dichloramine T pack was introduced, rubber drain introduced into the wound. Child at the time had temperature of 104 degrees, next morning it had dropped to 100 degrees, child was allowed to go home from Touro. They returned to my office for dressing on October 8th, at that time temperature was 101, it was noted that the right leg was swollen near the ankle, there was redness, the

leg was flexed on the thigh, and there was a great deal of tenderness to the touch. Father was advised to take the child to Touro for an immediate operation.

Ether anesthesia, Miss Armstrong. Shaft of the tibia was exposed and a large quantity of pus was found in the soft parts around the ankle. Shaft of the tibia was trephined and pus was found in quantity—the cortex of the shaft was removed for a distance of about three inches until apparently healthy bone was reached. Dichloramine gauze pack was introduced in the medullary canal. Silk worm gut sutures were introduced.

Post Operative Course: Temperature dropped to normal in 48 hours—child's appetite improved—pain seemed entirely relieved. First dressing was done on the 5th. day, no pus was found and there was less swelling of the leg and foot. Wound was washed with ether and a dichloramine gauze pack was introduced. Patient was then allowed to leave the hospital and return to the office for dressing and inspection. When last seen the wound was granulating and seemed greatly improved.

The child was apparently doing well as the previous records will show. She was allowed to leave the hospital. The parents asked to be allowed to have a doctor in the country take care of the child. They were allowed to take the child home on the condition that they would return at least once a week so that I could dress the wound. At the end of this time they returned, the leg was very much swollen and there was evidence of a peri-articular infection. They were advised to take the child immediately to Touro for operation. This was done. Under ether anesthesia an incision was made over the ankle on both sides. The wound was packed with dichloramine T and the child returned to bed. Since that time the improvement has been slow, but noticeable. Child has gained in weight and at the present time, December 13, the wound is almost healed.

May 24th, 1920. Office. 2 weeks ago father noticed a small blister on leg. Yesterday a small sliver of bone came out.

There is a sinus on inner aspect of leg near lower portion of old operation scar.

The crippled on the streets, disabled as a result of a delayed diagnosis should be the most eloquent plea for early diagnosis and proper treatment of these cases.

DISCUSSION.

Dr. Matas: Though I have come too late to hear Dr. Cohn's paper I am sufficiently familiar with his studies and original research in bone pathology, through our association at Touro Infirmary, to be willing to endorse any conclusions he may have arrived at on the subject of acute osteomyelitis. The importance of this subject cannot be stressed too often in medical gatherings such as this in which the professional surgeon and general practitioner meet for mutual improvement. There are few surgical diseases in which a prompt diagnosis is more telling in its effect upon the future outlook of the patient than this. It is upon the early diagnosis and the surgical intervention that follows it that the fate of the limb and often the life of the patient depends. Delay means death to the bone: more often of the long bones—tibia, femur, or humerus—and with its destruction in part or in whole, a mutiliation or deformity will follow that even the most skilled efforts of surgery may fail to correct. Delay in diagnosis and tardy intervention always mean at least great suf-

fering, protracted or permanent disability and danger to life. The danger to life is not only from the primary focus, but from the secondary metastases. On the other hand, the relief and security obtained by prompt drainage is one of the happiest and most striking examples of the benefits of timely and judicious surgery. Hence it may be safely said that the fate of the limb and of the patient lies largely in the hands of the medical man who first sees him. As the general practitioner or family physician is usually the one first called to the bed side, it is upon his shoulders that rests the greatest burden of responsibility. That the diagnosis of acute osteomyelitis in its inciniency is fraught with difficulties and perplexities is only too well proven by the large number of cases that come to operation, long after the destruction of the bone and irreparable damage have occurred. The most frequent source of error lies no doubt in the confusion of a primary epiphyseal infection in close proximity to the joint and acute infection of the joint itself as most often occurs in acute inflammatory rheumatism. A careful examination, however, will demonstrate that the area or focus of the greatest tenderness and pain on pressure, is not in the joint, but outside of it, in the bone immediately above or below it, and that the pain and tenderness in osteomyelitis radiate away from the joint and not towards it. The effusion in osteomyelitis is a secondary phenomenon and is small in comparison of that of acute synovitis; furthermore the joint involvement in epiphyseal osteomyelitis is primarily monoarticular and not poly-articular as in rheumatism. The pain and constitutional disturbance in osteomyelitis is most violent. Dr. King has just spoken of bone felon and those of us who have experienced the distracting throb of a felon can realize how this pain is multiplied a thousand fold when the same affection attacks one of the long bones. The X-Rays are of little or no value in the differentiation of the first stage of osteomyelitis, nor is the blood picture. There are other conditions that may simulate acute osteomyelitis, especially in children who are its chief victims.—infantile scurvy, gonnorrheal arthritis of nurslings, (complicating Neisserian ophthalmia or vaginitis), acute arthritis deformans,—but in all of these the joint is the storm center and not the bone. From all this it is easy to understand that reasonably confusion and doubt should often arise even among experienced men and that the practitioner often prefers to test the diagnosis therapeutically rather than surgically. It is easier to try the salycilates, the cold-tar derivatives, and anti-rheumatic drugs before deciding upon an operation. To test the diagnosis by the administration of anti-rheumatic specifics is often spoken of as giving the patient "the benefit of the doubt." But to adopt a therapeutic test which means delay in demonsrating the efficacy or inefficacy of the drug is a perilous practice in a disease so rapidly destructive and disabling as acute osteomyelitis. What I understand as giving the patient "the benefit of the doubt" in all grave and menacing cases is to explore promptly, to expose the suspected focus by a properly made liberating incision which will relieve periosteal tension,—drilling into the bone itself, if necessary, to give issue to pent up, virulent exudates. If the exploration should prove negative, no harm will be done if the incision is made aseptically, whereas temporizing and procrastinating with drugs or other treatment may prove fatal to limb or life, or both.

I thoroughly agree on the point stressed by Dr. Martin that the drastic procedures adopted for a number of years for the relief of bone tension in acute osteomyelitis were unnecessarily severe and were responsible for the greater frequncy and mortality of the

pyemic metastases which are peculiar to this disease. We have learned to appreciate in this, as in many other acute infections, that the natural defenses can be trusted, in a large measure, when they are given an opportunity to display themselves by the mere act of drainage and relief of bone tension. At one time, nothing could satisfy the surgical conscience but the total removal and extirpation of the infected focus and the neighboring areas. In this way the whole length of the bone was guttered and the whole narrow canal was curreted and stripped of its contents. This procedure in dealing with the long bones, such as the femur, humerus, and tibia, when acutely inflamed, was no small operation and it is not to be wondered that septic and fatal metastases followed in many cases by opening up large, new avenues for infection. The recognition of this danger and a greater reliance on the natural defenses has brought about a most salutary result in surgical treatment of other great infections in the acute virulent stage, as in peritonitis and epidemic influenzal empyema. This greater conservatism has not only brought about the most salutary results, but has simplified the task of the surgeon so that in acute osteomyelitis we simply relieve bone tension at the primary focus by incising the periosteum and draining the marrow, if necessary, by drilling the bone sufficiently to give issue to the pent up exudates. By thus limiting the intervention strictly to the primary focus, the object is attained with a minimum of trauma and with the least danger to the patient.

In speaking of the dangers of metastases of bone pyemia, I must refer to another phase of the subject which has been scarcely recognized. That is the peculiar **elective affinity** of the staphylococcus pyogenes for young growing bone tissue. This may be spoken of as a manifestation of organotropism. We have been in the habit, as clinicians, since the days of Ogston and Rossbach to regard this organism as the essential bacterial cause of the disease. But it is quite evident from clinical observation alone that this organism, which is causally associated with so many different infections, is only a genus of species of a widely difused pathogenic organism susceptible of many variations or strains which show their specificity by their elective affinity for certain definite tissues. In this sense the staphylococcus aureus is like the streptococcus and the pneumococcus and other organisms that exhibit common group characteristics, morphologically alike, but susceptible of division into many subvarieties which are chiefly distinguished by their cultural reactions and especially by their elective affinity for certain tissues. No one who has seen much of osteomyelitis can fail to have been struck by the fact that when metastases occur they always take place in the bones and in young children, preferably in the epiphyses. When the pyemic stage is established, the septic infarcts, as a rule, do not localize as in other staphylococcus infections in the lungs, kidneys, brain, heart, liver, spleen, and other organs, but almost invariably in some part of the skeleton, always in bone tissue or in epiphyseal cartilage. In this respect the staphylococcus displays the specific variations and elective affinities which have been so well studied in the streptococcus and pneumococcus by Rosenau to whom we are chiefly indebted for the concept of bacterial organotropism as a fundamental generalization of great clinical as well as pathological importance. The tropism of the staphylococcus for bone analogous to the elective affinity of the tetanus toxin for the motor ganglion cells of the cord, of the diphtheria bacillus for the faucial tonsils, of the meningococcus for the meninges, of the pneumococcus for the lungs, of the typhoid

bacillus for the lymph nodes of the intestines, of the virus of rabies for the central nervous system, of the organism of polyomyelitis for the anterior horns of the spinal cord, of the malarial plasmodia for the red corpuscles of the blood, and of certain strains of the treponema of syphillis for the cerebro-spinal axis.

These and other numerous illustrations that could be quoted to show that the elective affinity and specificity of the bacteria for certain tissues, are also analagous to the tropism displayed by various chemicals, dyes and drugs for different tissues so well exhibited in staining histological sections, in the affinity of arsenic for the adrenals, etc., of certain dyes and drugs for certain organisms, as quinine for malarial plasmodia, mercury and arsenic for the treponema of syphilis and for other spirochitoses and spirilloses.

That the elective affinity of the staphylococcus for bone as its special pasture, is due to a specific strain acquired in its primary cultural nidus in the bone tissue, is in conformity with clinical experience and is amply supported by the experimental facts that Rosenau so fully demonstrated in his splendid research on the "Selective localizations of the streptococcus," published in 1915. His experiments demonstrated that 68 per cent of 68 rabits injected intravenously from streptococcal cultures obtained from infected appendices, developed appendicitis in these animals and that only 5 per cent of lesions in the appendix were caused by streptococcus from other sources. Twelve strains from cholecystitis produced lesions in the gall bladder in 80 per cent of 41 animals injected, in contrast with 11 per cent caused by other strains; 18 strains from ulcers of the stomach or duodenum produced hemorrhages from the stomach or duodenum in 60 per cent of the injected animals. Forssner's experiments also show that streptococci grown in kidney and kidney extracts display especial affinity for the kidney when injected intravenously.

The practical application of these researches to the treatment of acute infectious osteomyelitis by elucidating its pathogeny is far-reaching; they suggest a great field for study in the serotherapy of this disease in the form of specific antitoxins; they also account for the failure of the stock polymorphous and polyvalent vaccines that have been applied so unsuccessfully (at least in my experience) in the treatment of this disease and especially in its pyemic phase. I am sorry to say that both the autogenous and stock vaccines in a number of typical cases, have utterly failed in my hands. I have more hope in the future of specific antitoxins.

The chief outcome of this discussion is that the progmosis of acute infectious osteomyelitis has been enormously improved in recent years by the great progress accomplished in the surgical treatment of its earliest stages when success will always depend upon the timeliness of the diagnosis (which is still a fruitful subject for discussion) but the greatest accomplishments in the control of this disease, in its most destructive metastatic form are still reserved for future research.

Dr. E. D. Martin: Dr. Cohn deserves great credit for bringing this subject before the society. Though a very common disease it is one which seems most difficult of early recognition. We have to-day five cases in our ward at Charity Hospital, in young negro girls.

Its onset, though sudden and often violent, is too frequently mistaken for other conditions. It is ushered in, usually, with a chill, high temperature, and acute localized pain, often following a history of trauma, which favors such infections. Futhermore, it is essen-

tially a disease of childhood, appearing most frequently between the ages of 12 and 17 years.

Early diagnosis is important for two reasons: first, to save the patient a long siege of suffering, second to prevent the extensive destruction of bone. Dr. Cohn has stressed the importance of operating as soon as the diagnosis is made, and well he has. I know of no more rapidly fulminating disease that we have to deal with. The diagnosis must be made on the history of the case. X-ray is of no value in the early stages, though some authorities believe that a diagnosis may be made by a comparison with the shadows of the opposite limb.

I wish also to stress the suggestion made by Dr. Cohn in the method of operating on these cases. There was a time when we did most extensive and unnecessary operations on these patients, resulting too often in metastasis and even death, by opening up the Haversian canals and creating new avenues of infection. Conservation should be exercised in all cases. Drainage and wet dressing is all that is necessary in the early treatment of the disease.

Three years ago I was called in to see a boy 8 years of age, in an attack of pneumonia. A few days before his illness he struck his leg against some obstruction and at the time I was called he had a slight swelling above the ankle with some discoloration but little pain. I believe the gravity of his condition masked the local symptoms. I saw him two days later and there could be no doubt as to the diagnosis. We were facing a serious problem. He was moved to an institution, nitrous-oxide gas, suffcient to quiet him, was administered and an incision made over the crest of the tibia through the periosteum, exposing the bone. With an antrum trephine two small openings were made into the medullary canal and wet dressings applied. Ten days later the same operation was performed, higher up, and by this manner the boy was carried over. After several operations, lasting through a long convalescence the boy recovered.

Too many of these cases have been treated for other diseases, the true story being told only when the limb had to be sacrificed or its functions destroyed. Dr. Cohn's paper is most timely and most important.

In conclusion, the three most important points are: early differential diagnosis, immediate operation, and conservative treatment.

Dr. A. C. King: Osteomyelitis has always been a very interesting subject to me on account of our seeming lack of ability to diagnose the conditions early. There is no doubt as to its being a blood borne disease; as witnesses to this, many cases can be traced to infections in other parts of the body—carbuncles, boils, abscesses and local infections due to bruises, etc.

We diagnose felons early, why? Because we keep in mind a little anatomy and a little pathology. We know that in the finger ends the lymphatics run straight down to and beneath the periosteum, therefore infection is carried between the periosteum and bone. Pus collects there, pain is intense and instead of waiting for fluctuation we incise early and deep, splitting the periosteum freely. Cases so treated within 48 or 72 hours are usually well within a week or ten days. We should recognize osteomyelitis equally as early if we expect quick and satisfactory results.

The disability and loss of time in this condition is distressing on account of the chronicity. Our hospital cases, as a rule, are chronic neglected cases and remain with us for months and months at a time. As Murphy states in regard to suppurative appendicitis,

"When pus formation occurs it is an evidence that that case has been neglected by someone." So, in osteomyelitis, where we find a fluctuating mass along a long bone we know that the products of infection have broken through and gone on to pus formation and bone destruction simply because that case has been neglected by someone.

Dr. Cohn (Closing): I wish to thank the members of the society for their liberal discussions. There is very little to add to Doctor Matas' complete discussion of the subject. I wish only to emphasize again the importance of early diagnosis and early operation; not waiting for the X-ray to confirm the diagnosis.

DIFFUSE GONOCOCCAL PERITONITIS REPORT OF A CASE.*

By DR. E. A. FICKLEN, New Orleans.

The first case of general peritonitis caused by the gonococcus in pure culture was reported by Dr. Harvey Cushing in May, 1899. The latest case was reported by Dr. Maurice Gelpi at the last meeting of the Louisiana State Medical Society.

In reviewing various articles on diffuse peritonitis, it is found that the gonococcus is seldom mentioned as an etiological factor. Localized pelvic peritonitis is a frequent complication of gonorrhea in the female and such cases excite no attention. The disease commonly spreads to the cervix and from there to the tubes with little disturbance to the endometrium. The mucous lining of the tubes become swollen, the fimbriæ retract, and when the acute stage has passed, the abdominal ostium is usually closed, either by contraction or by adhesion to neighboring viscera. This sealing of the tube is a natural protective barrier, and is ordinarily re-enforced by intestinal and omental adhesions which isolate the pelvis. It must be noted that contrary to the usual belief the ostium does not close at once during the acute stage. Sir John Bland Sutton stated that the tubes are open at first and pus can be seen leaking from them. The gonococcus may reach the peritoneum through the patulous tube, through the blood stream in bacteremia, or rarely through lymphatic channels. Peritonitis is one of the rare complications of gonorrheal vulvo-vaginitis in children, and has a high mortality. This phase of the subject is thoroughly covered by Norris in "Gonorrhea in Women."

---

*Read before the Orleans Parish Medical Society, October 24th, 1921.

In discussing Dr. Gelpi's case, I stated that only about thirty cases of gonococcal peritonitis had been reported, but I have since found that in 1907, Goodman collected seventy-five cases, thirty of which were confirmed by bacteriological examination. I wish to make a differentiation between the case here reported and the much more usual cases of general peritonitis following rupture of the inflamed uterine adnexæ. Norris reports 99 cases of the latter type and notes that in the majority the ruptures were caused by violence, transportation, bimanual examination, coitus, pregnancy and labor. A violent febrile reaction with great pain and marked rigidity usually means a mixed infection with streptococci or colon bacilli. It has long been known that a pyosalpinx becomes sterile after a period of several months as the gonococci destroy themselves by their own toxins or are destroyed by the immune bodies of the host. Rupture, however, may take place before sterilization is complete, and the bacterial flora in cases of general peritonitis has comprised staphylococci streptococci, colon bacilli, as well as gonococci.

Brose, Cushing and others have stressed the peculiar dry fibrinous character of the peritonitis produced by the gonococcus. In my case there was abundant reddish fluid with widespread deposits of fibrin.

To summarize: diffuse peritonitis due to gonococcal infection is rare; it is more common in children than in adults; the disease is far more severe in childhood, causing temperature ranging to 104 degrees or above, whereas in adult life the temperature does not rise above 100.5. The mortality of this type is low—about 20 per cent. In Cushing's two cases peritonitis followed menstruation. The symptoms in some patients treated expectantly subsided in a few days, and the convalescence was not prolonged, but it must be emphasized that these were mild types. Surgical treatment gives a lower mortality.

The diagnosis can never be made positively until the laboratory has reported, therefore of Goldman's cases we are certain of thirty only. In the remaining forty-five, a peritonitis developed coincidentally with a genital gonorrheal infection, but absolute proof of specific origin is lacking.

Case Report: Mrs. J. M., referred by Dr. Verdier, aged 44, married, white, six para, Malaria 8 or 10 years ago. "Dyspepsia" for many years. Leucorrhea since adolescence. Had suffered for two days with violent cramps in the lower abdomen. Constipated. Persistent nausea.

Physical examination—Tall, thin, anemic, expression anxious. Heart and lungs negative. Temperature 98. Pulse 120. Abdomen moderately distended. Pressure over right lower quadrant produced agonizing pain. Right rectus rigid. Vaginal examination showed a profuse white discharge. Tubes and ovaries not palpated as examination was extremely painful. The white cell count was 18,500 with 92 per cent neutrophiles. The patient was moved to the Presbyterian Hospital at once, and after a hypodermic of morphine and atropine, was taken to the operating room. I suspected a gangrenous appendix.

The abdomen was opened in the mid-line below the umbilicus. A reddish brown purulent exudate, with many flakes of fibrin, poured out as soon as the peritoneal cavity was opened. The appendix was exposed, but it showed no more signs of inflammation than did the surrounding intestines. The uterus and tubes were brought into view by traction on the round ligaments and the peritoneal covering alone found involved. The fimbriae of the tubes were free and the tubes themselves were neither enlarged nor tortuous. I then turned to the upper abdomen, believing that the lesions must be either in the stomach, duodenum or gall bladder. A mid-line incision was made above the umbilicus. Exploration showed an intensely congested peritoneum with some fluid, but no perforation. It was noted that the involvement of the pelvis was far more marked than that of the upper abdomen. Drainage tubes were inserted to the cul de sac and the patient sent to the ward.

The explanation of the condition was not apparent until a few days later, when specimens of the pus from the drainage tube were sent by Dr. Verdier to Dr. Harris and to Dr. Adams. Both reported finding gonococci in pure culture. Ten days after the operation, the cultures and smears made from the abdominal wound were reported negative, but gonococci were still present in the vaginal discharge. On Nov. 27, 1919, six days after the first operation, the leucocyte count rose to 32,000 with 90 per cent neutrophiles. The patient began to complain of pain around the rectum, and the temperature which had remained below 99 rose to 100.8. On Dec. 1, the temperature was 101, the pain greater and examination revealed a large fluctuating mass to the left and behind the uterus. A pelvic abscess, containing several ounces of pus, was drained through the vagina the next day. Following this the patient improved a great deal, but her convalescence was by no means uneventful. On five or six occasions it was necessary to reopen the abscess cavity with dressing forceps. Whenever the drainage was not free, the temperature rose and the patient lost ground.

This case was finally discharged, cured, six weeks after the first operation. During this period, she was given a mixed stock gonorrheal vaccine by Dr. Verdier, who reported to me that her husband, a man of 56 also had an active gonococcal infection. The patient denied intercourse for a period of two years prior to illnes, so it is difficult to establish the duration of the infection.

In conclusion, I wish to thank Dr. Verdier for allowing me to use his notes in the preparation of this report.

SPECIFIC TREATMENT OF MALARIA.*

By C. C. BASS, M. D., School of Medicine, Tulane University, New Orleans

Introduction. Malaria is one of the very few diseases for which we possess a specific cure. The only specific remedy for malaria is quinine and, to a limited extent, certain other cinchona alkaloids. Therefore, specific treatment of malaria consists of treatment with quinine. Although other measures and perhaps certain other drugs may favorably influence the course of malaria to some extent, they are of negligible value as compared with quinine. In the present paper only the specific treatment with quinine will be discussed.

Action of Quinine in Malaria. Quinine acts in malaria by killing the malaria parasites in the circulating blood of the patient. Just how this is done is not definitely known, but perhaps the most prevalent belief is that the parasites are killed by some specific toxic effect of the drug on the parasites. If one studies the blood of suitable malaria patients following the beginning of quinine treatment, certain changes can be observed to take place in the parasites as soon as the quinine reaches the blood in sufficient concentration. These changes are noted chiefly or entirely in the asexual parasites, or schizonts, which are the parasites that produce the clinical symptoms, and not in gametes. The ameboid activity of the parasites is rapidly reduced and the pigment granules, which are normally very actively dancing within the cytoplasm of the parasite, first move much more slowly and later cease their motion entirely. In stained specimens it may be noted that the younger parasites, especially, stain more intensely.

Those parasites that are old enough to be irregular in outline seem to become more irregular and their cytoplasm becomes more filamentous, at first, but soon they retract into a round or oval mass. Ameboid activity appears to have ceased and the parasite is now probably dead. By this time the number of parasites begins to diminish, more rapidly in tertian and quartan infections than in estivo-autumnal. If the concentration of quinine in the blood is sufficient, most if not all the tertian or quartan asexual parasites disappear within twenty-four hours. Estivo-autumnal parasites may not disappear so rapidly. It

*Read before the Orleans Parish Medical Society, October 24th, 1921.

is not uncommon to find an occasional parasite even after the patient has been taking quinine for two, three or four days. The number, however, rapidly diminishes from the first. Some of these appear normal. There is good reason to believe and, in fact, we know that the parasites that appear in the circulating blood later, come out from locations in the organs and tissues of the body where they had not been reached by the quinine in the circulating blood to sufficient extent to destroy them. This alteration in the appearance, activity, staining qualities and final disappearance of the parasites following quinine results only when there is sufficient quinine in the blood stream to produce this effect.

Co-incidentally with the destruction and disappearance of the parasites, the active clinical symptoms, fever or chills and fever, stop. The effect upon the parasites and upon the clinical symptoms is dependent upon the amount of quinine taken. The dose of quinine and method of administration are therefore of the utmost importance. One of the chief objects of this paper is to emphasize, if I can, the proper dose and method of administration of quinine in the treatment of malaria.

The treatment of malaria may be conveniently divided into two parts according to the object in view. The first part is for the purpose of relieving the clinical symptoms and the second part for the purpose of entirely destroying the infection in the patient to prevent subsequent relapse and to prevent his being a source of infection to others. The patient may still have some parasites (sometimes too few for us to find them) long after the clinical symptoms have been relieved by destroying most of his parasites. They may multiply after treatment is stopped and give rise to relapse. It is not uncommon for patients to relapse from time to time over a period of months and sometimes several years, much to the discredit of the physician who treats them. This is possible only when not all of the parasites were destroyed. If every one was destroyed relapse could not occur and the patient would no longer be a possible source of infection to others.

There is the greatest variation in the methods of treatment advocated by different authorities on malaria. Hardly any two of them recommend the same method and what is more unfortunate, many of the methods recommended are impractical, un-

reasonable, not effective, unnecessarily harmful to the patient or unnecessarily difficult to carry out, all of which tends to defeat the purpose.

Amount of Quinine Necessary to Relieve Clinical Symptoms.—Quinine in large doses causes more or less discomfort in most people. In sufficiently large doses it may be very harmful and actually destructive of life. It is therefore desirable that the amount of quinine given for the relief of clinical symptoms should be the minimum that will accomplish the desired result. There is no good excuse for giving any more than this amount if we know what it is.

The clinical symptoms are stopped and the parasites in the blood are destroyed by smaller amounts of quinine in some individuals than in others. It occurs in some cases that as little as ten grains daily would have this effect, in others fifteen, twenty, twenty-five and sometimes thirty grains daily are required to produced the same effect. There is no way by which we can determine whether a given individual will be relieved by the smaller or will require the larger amount. Therefore, the only certain way to accomplish the desired result is to give the larger amount in all cases. If we could select those who would require only smaller amounts there might be some excuse for trying to individualize and treat each patient differently. Since we cannot, all cases of malaria should be given the same amount of quinine, 30 grains daily for adults and a proportionate amount for children, for the purpose of relieving the clinical symptoms. This is about the smallest amount that can be depended upon to give the desired result. At the same time, it is not larger than almost any person can take without unbearable discomfort or harmful effect.

Thirty grains of quinine daily causes the disappearance of the clinical symptoms, fever or chills and fever, practically always within three or four days. I am fully aware of the fact that many physicians think they have seen cases that continued to have fever or chills and fever due to malaria for much longer periods of time in spite of even much larger amounts of quinine. Practically all such cases are errors in diagnosis. I am not prepared to say that such cases may not sometimes occur, but I do say that they are so rare that I have not been able to see even one such case. I have been watching the effect of

this particular amount of quinine in malaria for the past six years and formulate circumstances have permitted me to see and to know of a great many cases of malaria who took this amount. I have not been able to see or know of a single instance where fever or chills and fever due to malaria did not stop within three days.

During the past summer one of our present Senior students, Mr. G. E. Whitaker, has endeavored to keep in touch with the malaria cases treated in several of the large hospitals of New Orleans, with instructions to note the amount of quinine taken and the duration of the fever or chills and fever. Any case in which the amount of quinine taken daily was 30 grains or more and in which fever lasted three days on this treatment, was to be reported to me at once for investigation. It was hoped that if cases do occur in which 30 grains of quinine daily fail to stop the clinical symptoms, I might be able to see them. More than fifty cases have been recorded and four. in which it appears that quinine had failed, were reported for investigation. One proved to be typhoid, confirmed by blood culture; in two cases the quinine had been recorded but had not been given and in the other the diagnosis could not be confirmed and there is good reason to believe it was not malaria at all. This experience would seem to indicate that 30 grains of quinine daily does not fail to stop the clinical symptoms in practically all cases of malaria treated in the hospitals in New Orleans. If there are exceptions, they are very rare, so rare that I have been unable to get to see them.

Mode of Administration.—Quinine may be administered intravenously, intramuscularly or orally. It reaches the blood stream more quickly when given intravenously and this method of administering the initial dose is to be preferred where there is great urgency and where there is good reason to believe the security of the life of the patient depends upon getting quinine into the blood stream at once.

This method of administering quinine, however, is a formidable procedure accompanied by a certain amount of risk and therefore should never be resorted to except under the extremely rare, exceptional, circumstances mentioned. I cannot believe that intravenous administration is justified under any other circumstances. Whenever given in this way the dose should

be small, never more than 10 grains of the bi-hydrochloride, and it should not be continued after quinine can be administered orally.

There is practically no place for hypodermic or intramuscular administration of quinine in malaria. It causes more or less damage to the tissue, sometimes producing abscesses. It is absorbed with less uniformity and less certainty, and sometimes acts more slowly than when administered orally.

Oral administration of quinine is convenient, practical, as effective as any other method and, in fact, it is the only method that can be followed in the treatment of ordinary cases of malaria if one gives due consideration to the interest and welfare of his patient.

Quinine administered orally is absorbed slowly and eliminated slowly. In a recent report of extensive investigation into the absorption and excretion of quinine in the urine, Nierenstein (1) found that it is "possible to detect quinine qualitatively in the urine (1) in a few minutes after oral administration and (2) seventy hours after administration had ceased." A single dose daily would therefore result in a fairly uniform concentration of quinine in the blood. So far as its effect upon the malaria is concerned it is immaterial whether the 30 grain daily amount is all given in one dose or in several divided doses. Large doses of quinine produce more gastric disturbance and other discomfort to the patient than smaller divided doses. Ten grains three times daily is a convenient and very practical method of giving the required 30 grain daily amount .

Quinine Passes Out of the Stomach Rapidly—It is of interest to note that quinine administered orally passes on out of the stomach rather rapidly. Nierenstein (1) found only traces of quinine "in the vomits of four cases soon after oral administration of large doses of quinine." This would seem to minimize the importance of another one of the excuses frequently given for not administering quinine orally.

Choice of Salt of Quinine.—With regard to the choice of salts of quinine, there is no conclusive evidence that one of the commonly employed salts is more effective than another. The

recent extensive research referred to above practically confirmed previous observation and conclusions. "It was found that there was no marked difference in the excretion of the bi-hydrochloride, hydrochloride, hydrobromide, bi-hydrobromide, sulphate and the free alkaloid given orally." No salt of quinine is more effective in destroying parasites and stopping clinical symptoms than the sulphate. Since this is the salt in most common use and for the sake of uniformity, it is the one to be recommended. There is nothing to be gained by one of us teaching, advocating and practicing the use of one salt and one another if they are all equally effective. Such teaching and practice tends to confusion and also mysticism which certainly should be avoided with regard to malaria.

Treatment to Cure the Infection.—After the clinical symptoms have been relieved by 10 grains quinine sulphate three times daily for a period of three or four days, treatment for the purpose of curing the infection should begin. We may not be able to find malaria parasites in the blood at this time, but if no more quinine is taken the patient will usually relapse in from a few days to a few weeks or months, showing that he was still infected though the clinical symptoms had stopped and no parasites could be found in the blood. There are some parasites localized in certain organs and tissues, chiefly perhaps in the bone marrow and spleen. In due course of time they reproduce and come out into the circulating blood.

Quinine kills only the parasites in the circulating blood at the time and does not kill those lodged in the tissues. The most certain way to destroy the infection is to keep a sufficient amount of quinine in the blood stream at all times to kill any parasites that appear in the blood. If this is kept up long enough all the parasites in the body of the individual are destroyed and the infection is cured.

Amount of Quinine Necessary to Kill Parasites as they Appear.—If we give 5 grains quinine daily to a number of persons who are infected with malaria but who have no clinical symptoms at present, most of them remain free from clinical symptoms while taking it and some finally lose their infection. A considerable proportion, however, sooner or later develop clinical symptoms in spite of the quinine and parasites become

numerous and demonstrable in their blood. This shows that 5 grains daily is not sufficient to destroy the parasites and cure the infection in all cases.

If, on the other hand, we give to a similar group of malaria infected persons 10 grains quinine daily, practically none develop clinical symptoms or numbers of parasites in their blood while taking it. Once in a great while a person may develop symptoms and parasites may multiply in his blood while taking this amount. Though the number of such instances is negligible, at the same time it shows that 10 grains daily is about the minimum amount that can be depended upon to kill the parasites as they appear in the blood and to finally destroy the infection. Of course, any larger amount would produce the same result, but it is desirable to give the minimum amount that will have the desired effect, from the standpoint of economy and especially out of consideration of the patients' comfort. Unnecessarily large amounts of quinine produce more or less discomfort and have no better effect. The discomfort often causes the patient to quit the treatment before his infection is destroyed and therefore defeats the purpose. Ten grains daily is therefore, about the proper amount (not too small to produce the desired effect, not large enough to produce unnecessary discomfort) to destroy the infection. This amount can be taken in one dose satisfactorily and at night before retiring is probably the most convenient and practical time in most instances.

Duration of Treatment Necessary to Cure the Infection.—If we should give 10 grains quinine daily to a group of malaria-infected persons for only one week and stop, a small proportion would be disinfected by even this short treatment, but most of them would relapse sooner or later. If the treatment is continued for two weeks a larger per cent. would be disinfected. If it is continued for four weeks, 60 to 70 per cent. are disinfected. If it is continued for eight weeks, between 90 and 95 per cent. are disinfected. It would probably take more than three months' treatment to disinfect 100 per cent.

It is very apparent that a much longer period of treatment is required to disinfect certain individuals than others. Unfortunately, we have no way by which we can determine in advance which cases will be disinfected in short time and which will require treatment for a much longer time. Neither can we

examine a patient during the course of treatment and determine that he has been cured. The absence of parasites from his blood or other symptoms have no significance in this regard. Since we have no guide as to the duration of treatment a given patient will require and no guide as to when he is disinfected, we must treat all cases alike. We cannot and should not individualize. Quinine should be given in every case for a period which is known to disinfect a satisfactorily high per cent. of cases.

Since treatment for a comparatively short period disinfects a considerable per cent. of cases and since a very long period, more than three months, is required to disinfect 100 per cent., it seems permissible and advisable to select a period which falls slightly short of perfect results in all cases but does disinfect almost all cases. Eight weeks does this and this period has been adopted and is now taught and practiced by the majority of the leading students and workers in malaria in this country.

The Standard Treatment for Malaria. The treatment described above, "For the acute attack, 10 grains of quinine sulphate by mouth three times a day for a period of at least three or four days, to be followed by 10 grains every night before retiring for a period of eight weeks,"

was adopted two years ago by the National Malaria Committee (2) and recommended as the standard treatment for malaria. Since that time it has been endorsed and approved by the United States Public Health Service, it has been published and recommended as an official method of treatment in Military Medical Review, published in the office of the Surgeon General, it is taught in the Army Medical School and several other medical schools, it has been adopted as the approved method of treatment in many of the hospitals of this country, it is being employed in much of the malaria control work of different health agencies, and it is being followed with much satisfaction by a rapidly increasing proportion of the physicians of this country and some foreign countries. I wish to recommend to those present serious consideration of adoption of the standard treatment as a routine method of treatment of malaria.

REFERENCES.

(1) Nierenstein, M. Report on the Excretion of Quinine in the Urine (War Office Investigations) in Observations on Malaria by Medical Officers of the Army and Others. His Majesty's Stationery Office, London.

(2) U. S. Public Health Reports, Vol. 34, No. 52, December 26, 1919, p. 2,959.

NECROSIS OF SKULL WITH RESULTING MENINGOCELE; REPAIR BY TIBIAL TRANSPLANT.

By J. T. NIX M. D. and J. M. PERRET, M. D.
(From the J. T. Nix Clinic, New Orleans).

Among the interesting cases we have lately seen at the clinic is the one which furnishes the subject-matter of this report. It was one showing complete destruction of a part of the right parietal bone near its eminence. The diameter of this loss of bony substances was about one inch and the dura mater herniated through the opening.

Syphilis can produce such a condition and as the Wassermann reaction was positive, it is probable that it was the etiological factor. It is not so often that we see this syphilitic manifestation. The trouble probably began as a periostitis and later the outer table became involved and finally the inner one We are led to this supposition as there was more destruction of the outer than of the inner table. If the pathological process had started from a lesion within the skull we would have expected more destruction of the inner than of the outer table, on account of intra-cranial pressure.

Between the time the patient was first seen at the Clinic on December 28, 1920 and her operation on April 21, 1921, she had been placed on vigorous and anti-syphilitic treatment, receiving four injections of salvarsan and mixed treatment internally. This by itself was not enough to relieve her and surgery had to be resorted to. The object of the surgical intervention was to relieve pressure on the brain which on account of the intra-cranial pressure was being herniated through the skull and also to protect the brain from injury by filling the gap in the bone. The history of the case follows:

Mrs. H. H. K., white female, 43 years, native of Louisiana was seen at the Clinic on December 28, 1920, and complained of a "thumping sensation in right side of head."

Present Illness.—This began six years ago with a thumping sension over an area about the size of an adult's thumb-nail and located over right upper part of head. This thumping was constant, but there were periods in which it was more severe. It was always aggravated by lying down and also by sneezing. Sometimes she felt so badly that she had to remain in bed. It was seldom that she could get more than half a night's sleep. At no time did she complain of headache, dizziness or vomiting. The first physician that she consulted prescribed some pills and capsules. These gave her temporary relief for a short while when she was taking them. Soon, however, they failed to relieve her. She then on her own initiative

began to take Aspirin in ten grain doses and felt some relief.

About a year after the onset of her present illness, she noticed a soft spot about the size of the tip of the index finger which she describes as feeling like a baby's fontanelle. At this time she went to one of our local hospitals and came under the care of a neurologist who for eight months gave her some internal medication and applied the electric battery. There was no improvement. The thumping continued. Six months later she went to another of our local hospitals. There she seems to have been well studied from a diagnostic point of view. She was given some drops to take, but after a few doses her eyes became sore and she was told to discontinue them. She remained under observation for ten months and her condition was stationary. In the meanwhile she was depending on Aspirin for relief. Eight months after her second hospital experience she consulted a physician who treated her for a month with green pills. No benefit therefrom. After this she returned to the first physician whom she had consulted and saw him at various times. He advised her that his medicine was only giving her temporary relief and that he could not cure her. After this she came to the Clinic.

Past History. Measles, pertussis and yellow fever in childhood. Malaria at age of thirteen years and for three summers thereafter. Mild case of influenza in 1919. Menses began at thirteen years, last five to six days, twenty-eight day type, painless.

Marital History. Married twenty-three years. Mother of six children. Four are living and well. One child died in infancy of infantile paralysis. One child was still-born. No miscarriages. No previous operation.

Family History. Father, mother, two brothers and three sisters enjoy good health. One brother died in infancy of "consumption of the bowels." One sister was still-born. No cancer or pulmonary tuberculosis in the family.

Physical examination. General appearance is good. Weight 215 pounds.

Blood-pressure. Systolic 182, diastolic 120.

Head. On right side of skull, occupying the posterior and upper lateral aspect of the parietal bone, is a loss of bony substance, about the size of a ten cent piece. The edges of the parietal bone are well felt and give one the impression of an old trephine hole in the bone. Through the opening in the bone can be felt a soft and very tender mass.

Eyes. Pupils are equal and react to light and accommodation. Knee jerks are negative. Tongue is negative.

Teeth. Only a few are left and these are in bad condition.

Chest. Lungs are negative. There is an accentuation of the second aortic sound.

Abdomen. Umbilical hernia, the ring of which is about 2 inches in diameter.

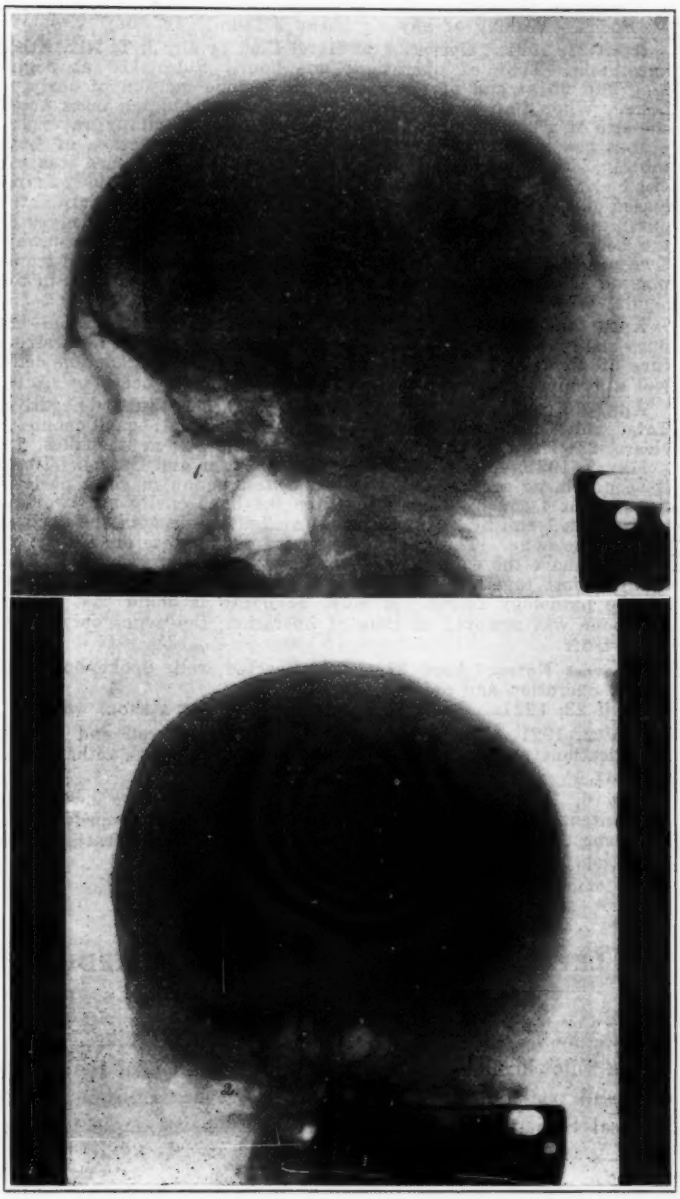
Laboratory Examination. Laboratory examination and X-ray by Dr. E. Escalante.

Urinalysis. Traces of sugar. No albumin or indican.

Total white count: 8500 per c. mm. Differential; small lymphocytes, 23; large lymphocytes, 2; eosinophiles, 2; neutrophiles, 73. Wassermann: 2 plus.

X-ray examination shows complete loss of both tables of part of right parietal bone, over an area about 3 cm. in diameter.

Fluoroscopy of Chest. Heart and aorta negative. Lungs negative. Hilus glands enlarged. Diaphragm negative.



1. Lateral view showing the extent of bone destruction and the bone grafts in position.
2. Antero-posterior view.

ARTICLE OF DRS. NIX AND PERRET.

December 28, 1920. Ear, nose and throat examination by Dr. V. Fuchs. Nothing of any significance found.

April 21, 1921. Operation at Hotel Dieu by Dr. J. T. Nix. Ether anesthesia. Time of operation; one hour. Pulse 110 at beginning and 90 at end of operation. Horse-shoe incision of scalp to bone. When flap was dissected down, a tense bulging mass about the size of a large marble and covered by a thick, shiny, gray membrane was exposed. There was a complete destruction of both tables of the skull over an area about 1 inch. The dura was excised close to the edge of the bone, cerebro-spinal fluid was released and the mass disappeared. There was more destruction of the outer than of the inner table. With rongeur forceps the edges of the bone were evened off, very little of the bone was cut away. Two pieces of the right tibia 3 cm. by 1 cm. were taken and transplanted parallel to each other in order to bridge over the gap in the skull. Wound closed with silk worm gut sutures.

April 21, 1921. The following report was received from the dura mater specimen removed at operation: tissue received has structure of meninges. Shows no inflammation, glial or ganglion cells. Not a gumma or a neoplasm, but possibly a meningocele.

April 30, 1921, Wassermann negative; Tschernogubow negative. Total white count 10,500 per c. mm., Differential: small mononuclears, 23; large mononuclears, 2; eosinophiles, 2; neutrophiles, 73.

May 2, 1921.—X-ray of skull by Drs. Fortier and Gately. There is seen a large area of complete bone destruction in right parietal bone about 4 cm. by 3 cm. Lying in the bone cavity are two line transplants 1 cm. by 3 cm. placed at a slight angle with the vertical axis of the bone. The upper extremity of the anterior transplant projects above the edge of the bone cavity to a slight degree. This X-ray report together with the radiogram gives a very good idea of the pathology found. It must be borne in mind that hardly any bone was removed at time of operation, the edges only being evened off.

Progress Notes. April 21, 1921. Reacted well. Spoke on evening of operation and did not complain.

April 23, 1921. Felt slightly dizzy to-day for a short while.

May 2, 1921. Discharged. She has felt very well and has no complications so far. She has sneezed several times without discomfort.

May 6, 1921. Sutures removed. The wounds have healed by first intention. The patient's condition continues to improve. No thumping. Complete relief. She has not received medication since operation. May 21, 1921. Improvement continues.

September 29, 1921. Continues well.

BULLETIN OF THE LOUISIANA STATE MEDICAL SOCIETY.

By P. T. TALBOT, M. D., Secretary-Treasurer.

The following is submitted for the information of the Chairman and personnel of each committee of the Louisiana State Medical Society, in order that they may have ample time in

which to accomplish something in their respective field, before the annual meeting of the Society, April 11, 12 and 13, 1922:

STANDING COMMITTEES.

Committee on Scientific Work, Dr. P. T. Talbot, Chairman; Dr. A. Henriques, New Orleans; Dr. S. M. Blackshear, New Orleans, La.

Committee on Public Policy and Legislation, Dr. H. E. Bernadas, Chairman, New Orleans; Dr. Homer Dupuy, New Orleans; Dr. W. H. Block, New Orleans; Dr. J. E. Knighton, Shreveport; Dr. P. T. Talbot, New Orleans.

Committee on Publication, Dr. P. T. Talbot, Chairman, New Orleans; Dr. Amédée Granger, New Orleans; Dr. C. J. Gremillion, Alexandria.

Committee on Budget and Finance, Dr. J. J Wymer, Chairman, New Orleans, La.; Dr. M. J. Lyons, New Orleans; Dr. J. O. Weilbaecher, New Orleans; Dr. J. M. Koelle, New Orleans; Dr. C. G. Cole, New Orleans.

Committee on Medical Education, Dr. L. R. DeBuys, Chairman, New Orleans; Dr. B. W. Smith, Franklin; Dr. C. W. Allen, New Orleans.

Committee on Medical Defense, Dr. Allan Eustis, Chairman, New Orleans; Dr. R. O. Simmons, Alexandria; Dr. J. C. Willis, Shreveport.

SPECIAL COMMITTEES.

Committee on Health and Public Instruction, Dr. P. H. Fleming, Chairman, St. Martinville; Dr. E. L. Leckert, New Orleans; Dr. T. A. Roy, Mansura; Dr. R. O. Simmons, Alexandria.

Committee on Cancer Control, Dr. W. H. Harris, Chairman, New Orleans; Dr. J. C. Willis, Shreveport; Dr. A. Henriques, New Orleans.

Committee on Hospitals, Dr. I. I. Lemann, Chairman, New Orleans; Dr. J. W. Newman, New Orleans; Dr. J. A. Lanford, New Orleans; Dr. L. J. Menville, New Orleans; Dr. D. I. Hirsch, Monroe.

Committee on Industrial and Economic Relations to Medicine, Dr. H. W. Kostmayer, Chairman, New Orleans; Dr. A. E. Fossier, New Orleans; Dr. Wm. H. Block, New Orleans; Dr. Geo. Roeling, New Orleans.

Committee on Health Problems in Education, Dr. A. A. Herold, Chairman, Shreveport; Dr. G. C. Antony, Alexandria, La.; Dr. A. L. Whitmire, New Orleans; Dr. H. P. St. Martin, Houma; Dr. S. L. White, Ruston.

The Society will expect a report from the Chairman of each Committee, on their respective workings and accomplishments during the year, to be read at the annual meeting in Alexandria.

The following list of Chairmen, Scientific Sections, Annual Meeting of the State Society, 1922, is published again for the information of the membership:

Section on Medicine & Therapeutics, Dr. Hamilton P. Jones, Chairman, New Orleans.

Section on Pediatrics, Dr. John Signorelli, Chairman, New Orleans.

Section on Nervous Diseases, Dr. C. S. Holbrook, Chairman, New Orleans.

Section on Bacteriology & Pathology, Dr. G. H. Hauser, Chairman, New Orleans.

Section on Pub. Health & Sanitation, Dr. B. A. Ledbetter, Chairman, New Orleans.

Section on General Surgery, Dr. J. L. Adams, Chairman, Monroe.

Section on Gynecology & Obstetrics, Dr. J. I. Peters, Chairman, Alexandria.

Section on Eye, Ear, Nose and Throat, including Stomatology, Dr. C. A. Weis, Chairman, Baton Rouge.

Section on Urology, Dr. I. B. Rougon, Chairman, Shreveport.

Section on Dermatology, Dr. C. B. Erickson, Chairman, Shreveport.

Section on Radiology, Dr. S. C. Barrow, Chairman, Shreveport.

Dues, for the year 1922, Louisiana State Medical Society, are now being accepted in the office of the Society, No. 1551 Canal Street, New Orleans, La. If your Parish **IS** organized, send your dues in to the Secretary or Treasurer of your Parish Society. If your Parish is **NOT** organized, kindly make check payable to the Louisiana State Medical Society, in amount $4.00 and mail direct to the office of the Secretary of the State Society.

NEWS AND COMMENT.

AT THE RECENT MEETING OF THE SOUTHERN SURGICAL ASSOCIATION held in Pinehurst, N. C., Dr. C. Jeff Miller, was elected president for the year 1922. Memphis, Ttenn., was selected as the next meeting place.

THE AVOYELLES PARISH MEDICAL SOCIETY met at Cottonport in December and elected Dr. C. Jeansonne, president; Dr. K. A. Roy, vice-president; Dr. S. J. Couvillon, secretary-treasurer; Dr. R. G. Ducoté, delegate to the State Society in Alexandria next April.

THE EAST FELICIANA PARISH MEDICAL SOCIETY met with the Hospital staff in Jackson, La.. The name of our society was changed to Feliciana Medical Society.

The following officers were elected for 1922: Dr. A. F. Barrow,Pres; Dr. E. E. Evans, Vice-pres.; Dr. E. M Toler, Sec.-Treas.; Dr. J. W. Lea, Delegate to State Medical Meeting.

THE REGULAR MEETING OF THE ST. TAMMANY MEDICAL SOCIETY was held in Covington, December 8. Following officers were elected for 1922: President, Dr. A. G. Maylie; vice-president, Dr. J. K. Griffith, Slidell; secretary-treasurer, Dr. J. F. Buquoi, Covington. The forming of a Tri-Parish Medical Society was discussed and met with approval. It was decided to invite Washington and Tangipahoa to join in its formation.

MORE DOCTORS NEEDED IN THE PHILLIPINES. At present there are only 969 physicians in the Phillipines, or one physician for each 11,000 inhabitants. The mortality is 26 per 1000 against 13 per 1000 in other countries, while the infant mortality is nearly 300 per 1000 against 100. The mortality from typhoid is 32 per 100,000 while in New York it is 3.82 per 100,000, and death from tuberculosis is 504 per 100,000 as against 172 per 100,000 in New York. It has been figured out, therefore, that about 3,000 physicians are needed in the Phillipines, according to a speech by Dr. Jose Albert, Acting Dean of the College of Medicine and Surgery.

INCREASE IN THE ROLL OF THE RED CROSS in foreign countries is attributed to the use of methods in vogue in the American Red Cross in the distribution of badges and buttons, a surplus of which were sent to the League of Red Cross Societies for use

in foreign countries. American Red Cross emblems were distributed as follows: Swiss 80,000; Swedish 13,000; Italian 500,000; Venezuelan 5,000, and to the Hungarian Juniors 25,000.

THE AMERICAN RED CROSS "CHILD HEALTH EXPEDITION" has been touring cities of devastated France. It has shown for periods of two to three weeks in six French cities, Lille, Roubaix, Tourcoing, Cambrai, Douai and Valenciennes, besides a month in Paris. The attendance has averaged about 5,000 persons daily. Every feature of the rearing of children according to the soundest and most approved methods was shown. Several French and American organizations joined with the American Red Cross in providing the various specialized departments.

DIETITIANS ARE NEEDED IN PUBLIC HEALTH SERVICE, according to a recent circular issued by the U. S. Civil Service Commission. Application blanks and full information covering the examination for such positions in the Public Health Service hospitals throughout the United States may be obtained at Washington, or from the secretary of the local board of Civil Service Examiners, at the postoffice or courthouse in any city. No written examination will be given, but applicants will be rated upon the subjects of general education and technical training and experience. The basic entrance salary offered is $960 a year with possible promotion to $1344 a year; to all salaries there is added the increase of $20 a month granted by Congress. In addition quarters and subsistence are furnished free by the government.

TYPHOID DEATH RATE DURING THE WAR. The November bulletin of the Louisiana State Board of Health is responsible for the statement that out of the 4,000,000 U. S. troops in the World War there were only 213 deaths from typhoid! Anti-typhoid vaccine is furnished free to physicians by the Louisiana State Board of Health.

THE NATIONAL HEALTH EXPOSITION, occupying 60,000 square feet of floor space, will be held in the Jefferson County Armory at Louisville, Kentucky, from February 1 to 9, 1922, under the auspices of the U. S. Public Health Service, State Board of Health of Kentucky, Jefferson County Board of Health and the Health Department of the City of Louisville. It will include exhibits in hospitalization, nursing, dentistry, medicine and pharmacy. The University of Louisville, the public school sys-

tem and various local, state and national health organizations will participate.

STRASBOURG HOLDS CONGRESS OF FRENCH SOCIETIES. Recently there was held in Strasbourg, France, Congresses of Medicine, Surgery, Urology and Orthopedic Surgery, to honor Alsace upon the occasion of its return to France and the uniting of the ancient Faculty of Medicine of Strasbourg to the National University of France.

ILLINOIS BIRTH REGISTRATION DRIVE PLANNED. Among the states that have not qualified for the United States Birth Registration Area, Illinois stands alone among the northern states east of the Mississippi and the State Department of Public Health has decided to carry out a drive to secure complete birth reports. The State of Illinois had a birth rate in 1920 of only 18.4 per 1000 against a birth rate for the United States Registration Area of 23.7 for the same year. Even if the birth rate had been the same for the State as for the Area, by using 23.7 as a basis, there actually occurred about 154,000 births in the State and leaves nearly 30,000 unrecorded births in Illinois for 1920. It is interesting to note that out of 17 cities six of them made complete reports only after the State Department of Public Health had carried out campaigns in these places.

SOUTH CAROLINA HAS ORGANIZED A PEDIATRIC SOCIETY in which self information in all matters pertaining to pediartrics, passing on this information to the medical profession of the State so that they will become more interested in pediatrics and educating the laity along the lines which will lead to the prevention and lowering of infant morbidity and mortality. form the main objects of the Society.

COST OF INDUSTRIAL MEDICAL SERVICE DOUBLED. Since 1916, according to the last report by the National Industrial Conference Board, the average cost of health service in some 207 plants employing 764,827 workers was shown to be $4.43 per person, the cost varying from $1.84 a person in the tobacco business to $24.40 in mining. Of these amounts 69.5 per cent. went to doctors, nurses and attendants, the remainder being for equipment, supplies and for outside medical and hospital service. About one-sixth of the plants with from 500 to 1000 workers employed a full time physician, while in 19 plants with more

than 10,000 employees there was shown an average of six full time physicians for each plant.

A PAY CLINIC, the first of its kind to offer a general service in New York City, was opened by Cornell University Medical College on November 1, making it possible for persons of moderate means to have the services of specialists at fees which cover the actual cost of service, and taking care of that class of persons whose means will not permit them to avail themselves of these services otherwise and who, also, are not in the class of those to whom the charity services are open. The clinic is open every afternoon from 1:30 until 4 o'clock, except Sundays and holidays and on Tuesdays and Fridays until seven P. M. The Cornell Medical Faculty will direct the clinics. Physicians in the clinic will be salaried and every effort made to preserve an atmosphere of dignity, privacy and consideration for patients, with the same personal feeling between patient and physician which usually characterizes private practice. The rates for treatment will be as follows: For examination and treatment, each visit, $1.00; medicine, laboratory tests, x-ray photographs and other supplies at cost; diagnosis of cases requiring special examination and study, with group consultation of specialists and diagnosis, $10.00; thorough health examination to discover possible defects from diseases and to obtain advice regarding personal hygiene, $2.50.

PINEVILLE IS TO ERECT NEW BUILDINGS in its Hospital for the Insane. The contracts call for three dormitories to cost $231,000 and a dining hall to cost $201,300.

DEEP ROENTGEN THERAPY. A new x-ray apparatus, known as the deep roentgenotherapy machine, which is designed so as to allow only the passage of high or peak voltage, is reported to have been perfected in Germany and Switzerland, while we hear that Duane, at the Crocker Institute, is working on a machine of this kind but up to now has not reported results as the treatment is still under trial. In various cases of malignancy, the patient is kept under treatment for hours at a time, and as the constitutional effects of such severe treatment are marked resulting in destruction of blood cells, transfusion of blood is frequently necessitated.

FOREIGNERS SUSCEPTIBLE TO ACCIDENTS. Quoting from the Ohio State Medical Journal, we note that "more than 50 per

cent. of the fatal accidents which occur in Ohio industries are those of foreigners, or men who cannot read the English language. These men usually cannot read the precautionary measures posted by the Industrial Commission, and the employers, and are, therefore, unable to take care of themselves as well as American workmen. These warnings of danger are printed in several languages, but the foreigner either does not stop to read them, or neglects to follow the advice."

THE PUBLIC HEALTH SERVICE has issued a preliminary announcement of a series of Public-Health Institutes to be held during the coming year at New Orleans, the first place, in January 9-13, and in many of the larger cities throughout the United States under the auspices of the State Boards of Health and the Service. To quote from the bulletin, the aim of the Institutes is "not only the prevention of disease and the lengthening of human life, but also to have a greater degree of health and efficiency. It is concerned in all methods which help to achieve these ends and utilizes not only the medical sciences, but statistics, psychology, sociology, and education as well. Its progress during the last half century has been remarkable, since in all directions the field has expanded and in every portion of the field new vistas have opened. The record of past accomplishments is, however, only a promise of the contribution which the public health activities of the next 50 years may make toward the happiness and welfare of mankind."

CANCER FUND. Hon. Hiram H. Mills, of Hingham, Massachusetts, left the sum of $200,000 to Harvard University for the study of cancer, this fund to be known as the Elizabeth Worcester Mills Fund in honor of Mr. Mills' wife. Mr. Mills graduated in 1889 from Harvard, with Master of Arts degree.

LOVING CUP AWARDED. At the Kansas City meeting of the National Anesthesia Research Society in October, Dr. A. E. Guedel, of Indianapolis, was presented with a silver loving cup for distinguished services in the field of anesthesia research, the honor intended to express the approval and admiration of the Society for the work already done by Dr. Guedel, to recognize his priority in gas anesthesia in obstetrics in America and to encourage his further efforts in that line. It will be the policy of the Society to make similar awards of recognition in the future for work of distinction in the field of anesthesia.

THE SALVARSAN ADULTERATIONS IN GERMANY and other countries, which caused so much difficulty in the drug markets during the years 1919 and 1920, were recently taken up by the Criminal Court of the County of Hamburg and, after a trial lasting fourteen days, in which many experts were examined, the manufacturer, Gerloff, and his superintendent, von der Heyde, were sentenced to three and one-half years in prison and to five years disenfranchisement. Sixteen defendants received two-year prison sentences each, and sixty-two others who had conducted a flourishing business in adulterated Salvarsan were fined 20,000 marks.

THE JENNER MEMORIAL MEDAL of the Royal Society of Medicine has been conferred on Sir Shirley Murphy in recognition of his work in epidemiological research.

THE ORLEANS PARISH MEDICAL SOCIETY, at a general meeting held December 10, elected the following officers for 1922: President, Dr. Wm. H. Block; 1st Vice-President, Dr. E. A. Fossier; 2nd Vice-President, Dr. P. Graffagnino; 3rd Vice-President, Dr. T. A. Maxwell; Secretary, Dr. Elizabeth Bass; Treasurer, Dr. J. A. Lanford; Librarian, Dr. S. C. Jamison. The following were appointed as additional members of the Board of Directors: Drs. C. V. Unsworth, M. J. Lyons and L. A. Ledoux. The installation meeting will be held January 9 at the Hutchinson Memorial of Tulane University.

EDINBURGH ROYAL COLLEGE OF PHYSICIANS has honored Admiral W. C. Braisted, of Washington, D. C., and Dr. Walter L. Bierring, of Des Moines, Iowa, by conferring membership on them in recognition of the efforts of the National Board of Medical Examiners, of which they are both charter members, in promoting the closer relationship in matters of medical education between the Old and the New World. It is reported that these are the only honorary memberships conferred by the college since 1809.

THE AMERICAN SOCIAL HYGIENE ASSOCIATION held its eighth annual meeting in New York City on November 18, 1921, and Dr. Hermann M. Biggs was re-elected president.

PERSONALS: Dr. L. Emmett Holt, Emeritus Professor of Pediatrics in the Columbia University College of Physicians and Surgeons, New York, delivered the Lane Medical Lectures

in the Stanford University Medical School, San Francisco, from December 5 to 10. He also gave a clinic on children's diseases.

Dr. Harvey Cushing, Professor of Surgery at Harvard Medical School, was elected President of the American College of Surgeons, at its anual meeting held in Philadelphia during the week of October 25.

On November 10, the French Government honored Dr. A. D. Bevan, the President of the American Medical Association by making him a member of the Order of the Legion of Honor. A banquet in celebration of the event was given, at which more than 200 physicians were present. The medal was presented by the French Consul at Chicago, with the statement that the honor was conferred by the French Government in recognition of the great service rendered in the recent War by the American Medical Association .

President Livingston Farrand, of Cornell University, was elected President of the American Child Hygiene Association at its annual convention in New Haven, on November 5.

MARRIED: On December 10, at Montgomery, Alabama, Doctor Homer Harris to Miss Margaret R. Wilkinson, daughter of Rev. and Mrs. Richard Wilkinson.

On November 24, Dr. Stephen W. Stafford, formerly superintendent Charity Hospital, and Miss Marie Aurore Tircuit, both of New Orleans.

On December 7, at New Orleans, Dr. Labasse Joseph Robin to Miss Lydia de los Reyes.

REMOVALS: Dr. H. G. Morris, from Kentwood to Baton Rouge, La.

Dr. O. M. Chapman, from Hampo, La., to Stilwell, Kans.

Dr. R. E. Ellzey, from Pleasant Hill to Cedar Grove, La.

DIED: Dr. William Porter of Ocean Springs, Miss.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for November, 1921.

CAUSE.	White.	Colored.	Total
Typhoid Fever	2	3	5
Intermittent Fever (Malarial Cachexia)	.....	1	1
Smallpox	.....	.....	.....
Measles	.....	.....	.....
Scarlet Fever	.....	.....	.....
Whooping Cough	.....	.....	.....
Diphtheria and Croup	.....	.....	.....
Influenza	8	2	10
Cholera Nostras	.....	.....	.....
Pyemia and Septicemia	.....	.....	.....
Tuberculosis	26	24	50
Cancer	21	5	26
Rheumatism and Gout	1	.....	1
Diabetes	6	.....	6
Alcoholism	1	.....	1
Encephalitis and Meningitis	1	.....	1
Locomotor Ataxia	1	1	2
Congestion, Hemorrhage, Softening of Brain	23	7	30
Paralysis	3	3	6
Convulsions of Infancy	.....	.....	.....
Other Diseases of Infancy	12	10	22
Tetanus	1	.....	1
Other Nervous Diseases	9	2	11
Heart Diseases	67	37	104
Bronchitis	4	2	6
Pneumonia and Broncho-Pneumonia	14	15	29
Other Respiratory Diseases	1	1	2
Ulcer of Stomach	3	.....	3
Other Diseases of Stomach	2	.....	2
Diarrhea, Dysentery and Enteritis	16	10	26
Hernia, Intestinal Obstruction	2	1	3
Cirrhosis of Liver	3	2	5
Other Diseases of the Liver	1	1	2
Simple Peritonitis	.....	.....	.....
Appendicitis	7	3	10
Bright's Disease	17	12	29
Other Genito-Urinary Diseases	11	14	25
Puerperal Diseases	1	4	5
Senile Debility	.....	.....	.....
Suicide	7	.....	7
Injuries	27	20	47
All Other Causes	29	16	45
Total	327	196	523

Still-born Children—White, 18; Colored, 15; total, 33.

Population of City (estimated)—White, 290,000; colored, 110,000; total, 400,000.

Death rate per 1000 per annum for Month—White, 13.53; colored, 21.38; total 15.69. Non-residents excluded, 13.98.

METEOROLOGICAL SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure 30.10

Mean temperature 67

Total precipitation ..... 3.83 inches

Prevailing direction of wind, east.